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OKLAHOMA STATE DEPARTMENT OF HEALTH
PRELIMINARY ASSESSMENT REPORT

Date: September 18, 1989

Prepared by: Terry Andrews, Solid Waste Division, OSDH

Site Name: Brown Manufacturing Company OKD071793

Address: 13431 Broadway Extension Oklahoma City OK 73114

EPA ID#:

1. **Site Information:**
The Brown Manufacturing Company (BMC) site is located at 13431 Broadway Extension, Oklahoma City, Oklahoma 73114. The geographic coordinates are Latitute 35° 36' 25", Longitude 97° 30' 0". The BMC site is located along the Broadway Extension Service Road on the west side. The approximately 5 acres of property is privately owned by Mr. Russell Brown (405-751-1323, OKC). This investigation documented present site conditions and determined potential contaminants and migration pathways. (Ref 12)

2. **Background/Operating History:**
BMC has been operating a business which fabricates and finishes light metal since 1942 at this location. They produce aluminum grilles, sun louvers, and handrails. They have been allodizing, anodizing and pretreating metal with a eleven tank batch system. The waste water from this process is treated in a 3000 gallon rinse tank and two 7500 gallon settling basins. When the wastewater meets City Industrial Wastewater Discharge Permit levels it is discharged into the city sewer. I visited and toured the facility on July 11, 1989. I was told by C.D. Lawson, Facility Manager, that the site did not have any hazardous waste produced or disposed of on the property. During my tour, I did not see any areas which appeared to be storage or disposal sites for hazardous waste. The facility appeared to be organized and clean. (Ref 12) There are no known emergency or remedial actions at the site.

3. **Waste Containment/Hazardous Substance Identification:**
The site does not appear to have any hazardous waste on the site. According to the facility manager, BMC has always pretreated its wastewater and discharged it into the city sewer. (Ref 12)

SUPERFUND FILE
MAR 02 1992
REORGANIZED
Reviewed by 6H-ES
Date 1/10/90

PRELIMINARY REPORT
This does not constitute final opinion of EPA

9404596

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4. **Pathway Characteristics:**

a. **Air Pathway Characteristics -**
There does not appear to be any dust or particulate matter accumulating on or off the site resulting from operations at BMC. (Ref 12) I therefore do not feel that contamination of targets via the air pathway will occur.

b. **Groundwater Characteristics -**
The site is underlain by approximately 20 feet of Hennessey Shale which is poorly permeable and then approximately 1000 feet of the Garber Sandstone and Wellington Formation. The Garber and Wellington are very important aquifers in Oklahoma County. The City of Edmond has three wells which obtain water from the Garber-Wellington, these are located 3 to 4 miles from the site. (Ref 7,9,10) A net precipitation of -29 inches per year has been estimated.

c. **Surface Water Characteristics -**
Surface drainage from the BMC is controlled by a drainage ditch which leads north to Memorial Road. Intermittant streams and three small ponds allow the flow to move northwest where it enters Chisolm Creek after approximately 4 miles. Chisolm Creek flows north and enters Cottonwood Creek approximately 17 miles from the site. (Ref 1,2,3, and 12) Chisolm and Cottonwood Creeks do not have any recreational users. The average annual streamflow for these streams are unknown. The size of the upgradient drainage area is approximately 20 acres. (Ref 1) The one year 24-hour rainfall is 3.75 inches. (Ref 6) The BMC site does not lie in a flood plain and potential for flooding is minimal. (Ref 1,12)

d. **Onsite Pathway Characterists -**
The rear yard area of the BMC site is fenced and the rest of the facility is inside a large brick building. There appears to be low potential for any on-site pathway contamination. (Ref 12)

5. **Targets:**
Within four miles of the site there are four water wells which supply water to the Public Water Systems. Three wells are used by the City of Edmond and supply water to its population of 50,100. The nearest well is 3.25 miles from the site. The other well is located 3.75 miles from the site and supplies water to the RTA Trailer Park and Campground (pop 100). The surface water downstream of the site is not used as a drinking water supply. Private use of groundwater in the area is unknown.

The BMC site is located in an industrial area with other business located within .25 mile. There are single and multi-family residential areas located within .5 mile. There is a park and agricultural lands located with .25 mile. There are no known environmentally sensitive areas located within 15 miles of the site. The total population within 4 miles of the site is 41,770. (Ref 1,2,11)

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6. **Other Regulatory Involvement:**
BMC has a City Industrial Wastewater Discharge Permit. No other regulatory involvement in known. (Ref 14)

7. **Conclusions and Recomendations:**
Brown Manufacturing Company has been a manufacturer of light metal products since 1942. They use a allodizing and anodizing process which generates wastewater which is then treated and discharged into the city sewer. There is no evidence that BMC has stored or disposed of hazardous waste on the property. I recommend that no further remedial action be planned.

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REFERENCES

1. Britton 7.5 Quadrangle Topographical Map, U.S.G.S.

2. Spencer 7.5 Quadrangle Topographical Map, U.S.G.S.

3. Oklahoma and Logan County General Highway Maps, Oklahoma Department of Transportation, revised 1988.

4. Oklahoma's Water Quality Standards 1988, Oklahoma Water Resources Board, Adopted Feb 14, 1989.

5. Oklahomas Water Atlas, Oklahoma Water Resources Board, Publication No. 120, Nov 1984.

6. Herschfield, D.M., 1961, Rainfall Frequency Atlas of the United States. U.S. Weather Bureau Technical Paper No 40.

7. Public Water Supply Report 1985, Oklahoma State Department of Health.

8. Oklahoma Directory of Manufacturers and Products, 1963, 1972, 1974, 1976, 1978, 1980.

9. Groundwater Resources of Cleveland and Oklahoma Counties, Oklahoma Geological Survey, Circular 71, P.R. Wood and L.C. Burton, 1968.

10. Reconnaissance of the Water Resources of the Oklahoma City Quadrangle, Central Oklahoma, by Roy H. Bingham and Robert L. Moore, Oklahoma Geological Survey, Hydrologic Atlas 4, 1975.

11. Population Projections 1980-2000, Research and Planning, Oklahoma Employment Security Commission, July 1985.

12. Memorandum To: File, From: Terry Andrews, Subject: Visit to Brown Manufacturing Company.

13. Industrial Wastewater Disposal Permit #076-FC, Water and wAstewater Utilities Department, City of Oklahoma City.

14. Memorandum To: File, From: Terry Andrews, Subject: City Permit for Brown Manufacturing Co.

15. Memorandum To: File, From: Terry Andrews, Subject: Search of REcords for Brown Manufacturing Co.

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REFERENCE 1

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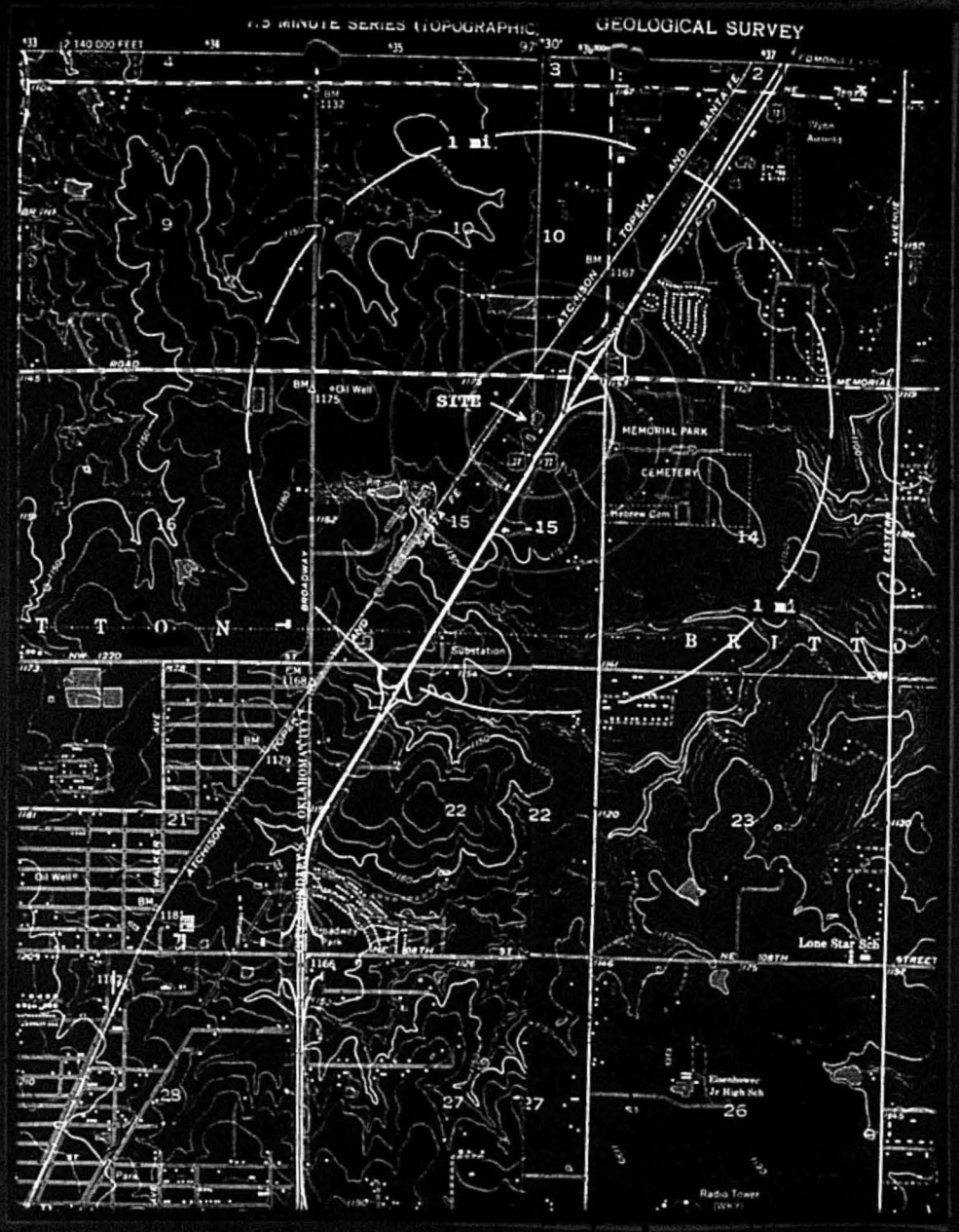

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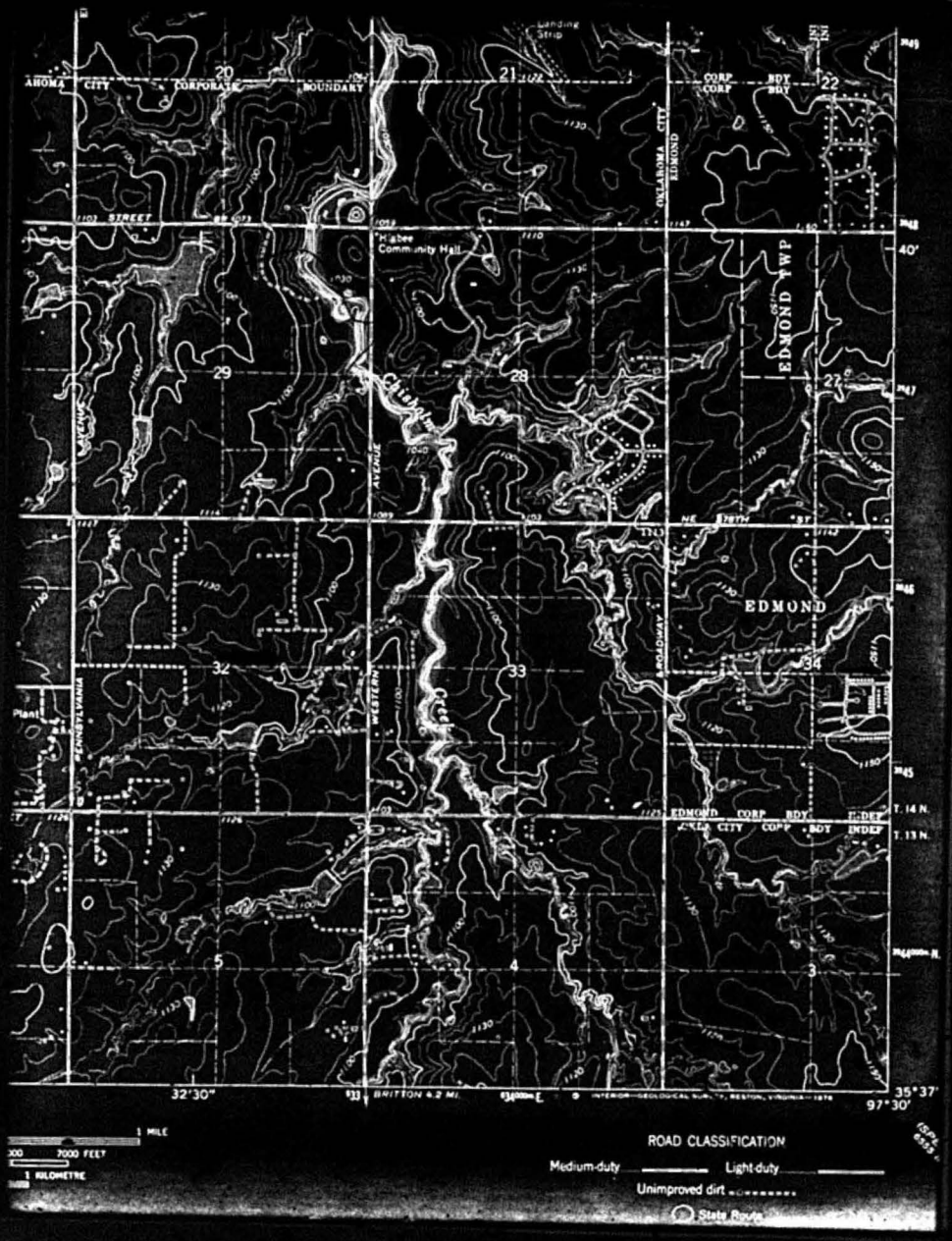

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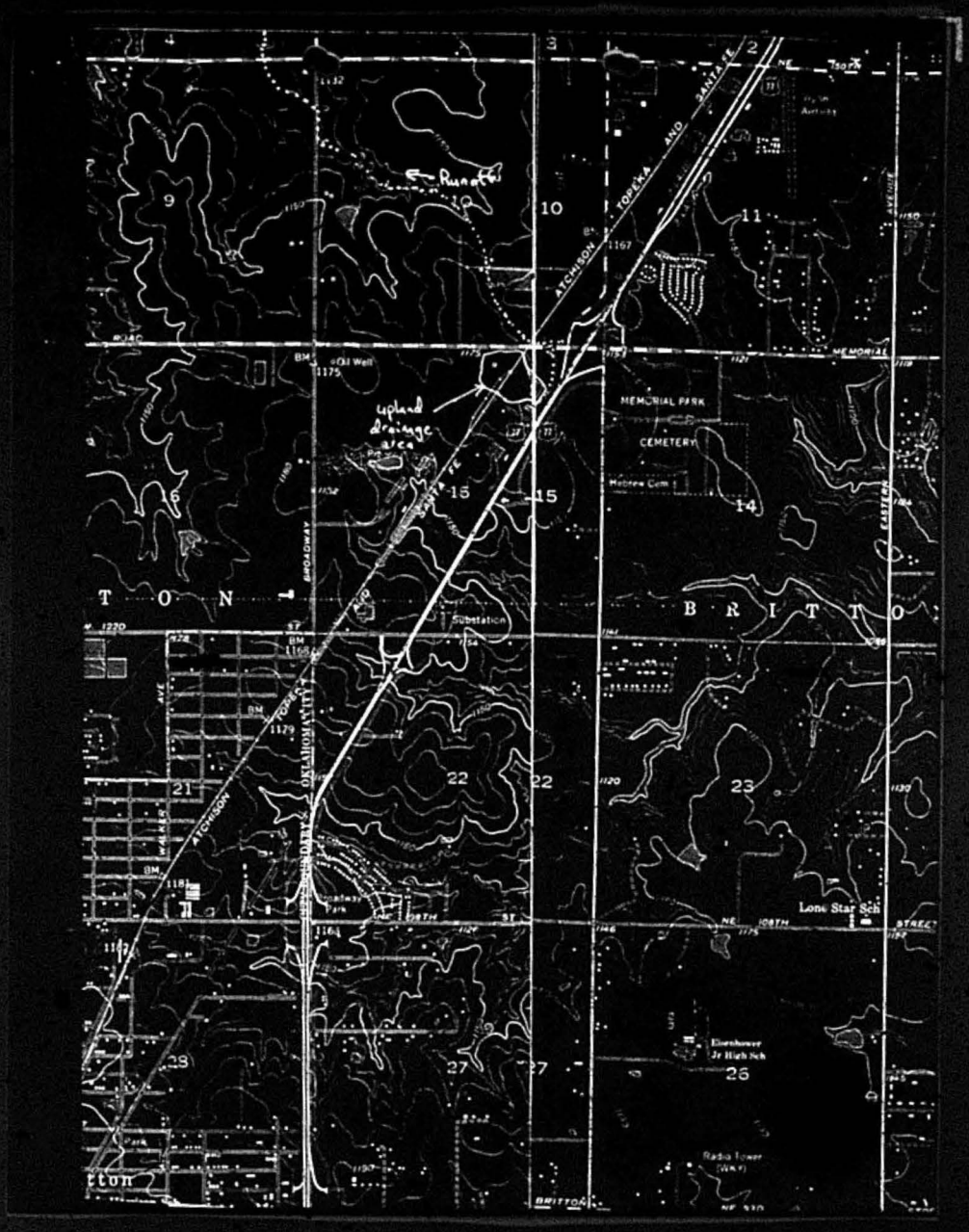

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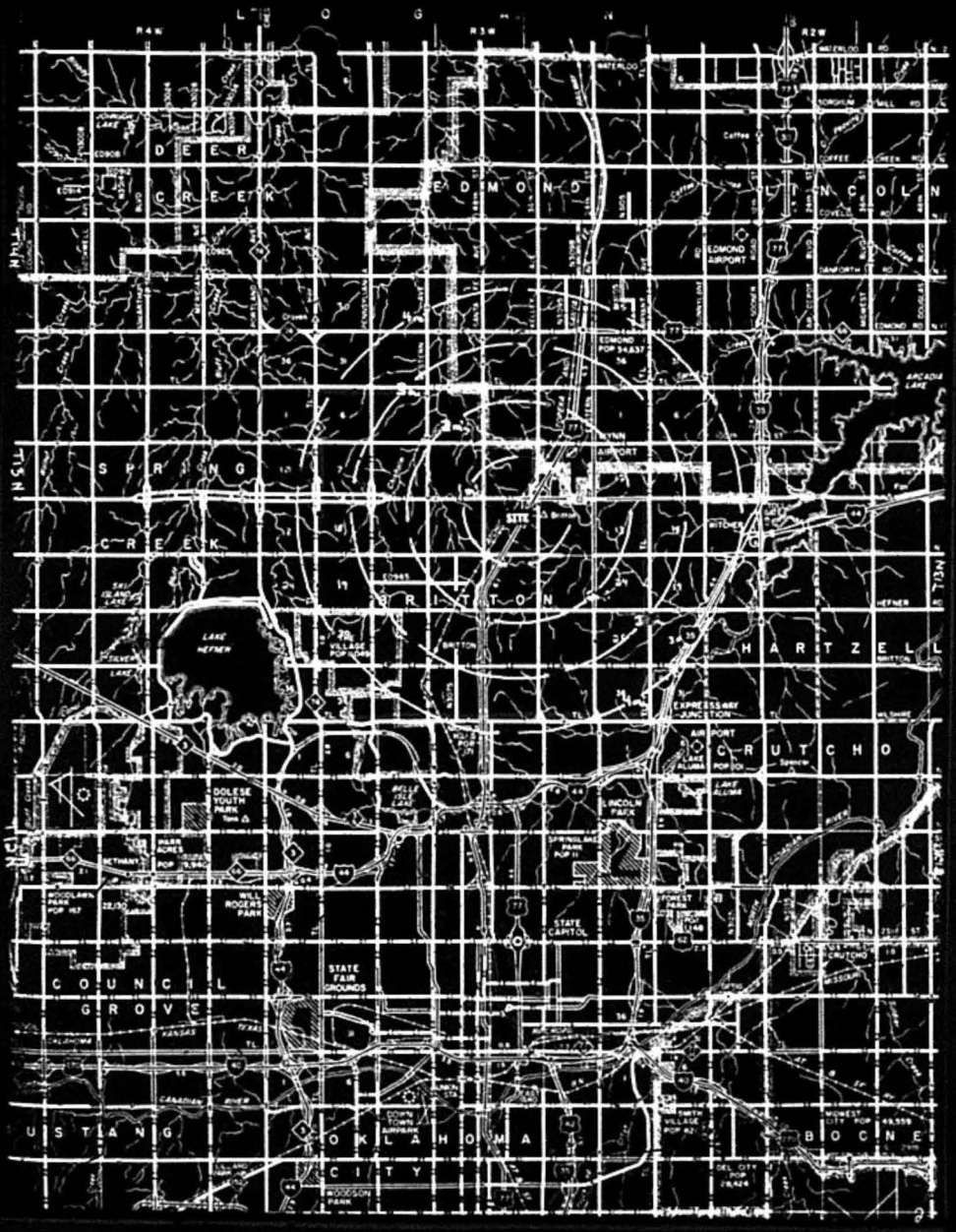

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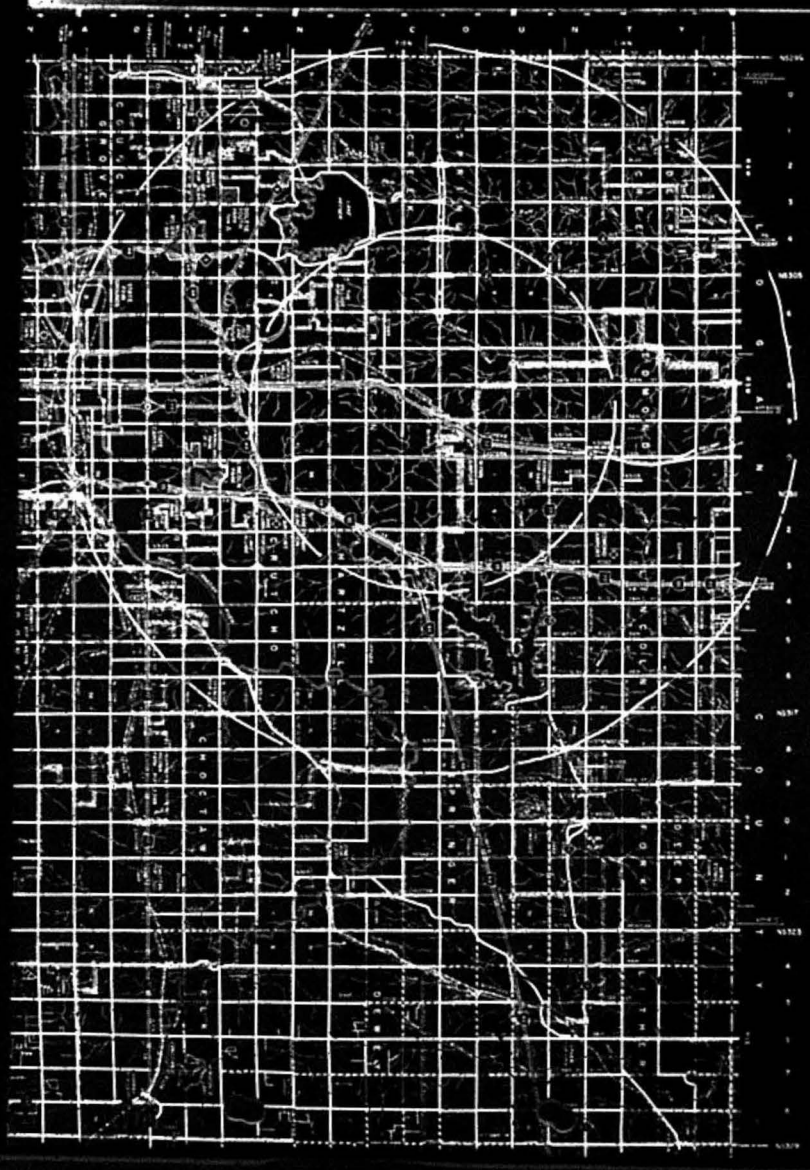

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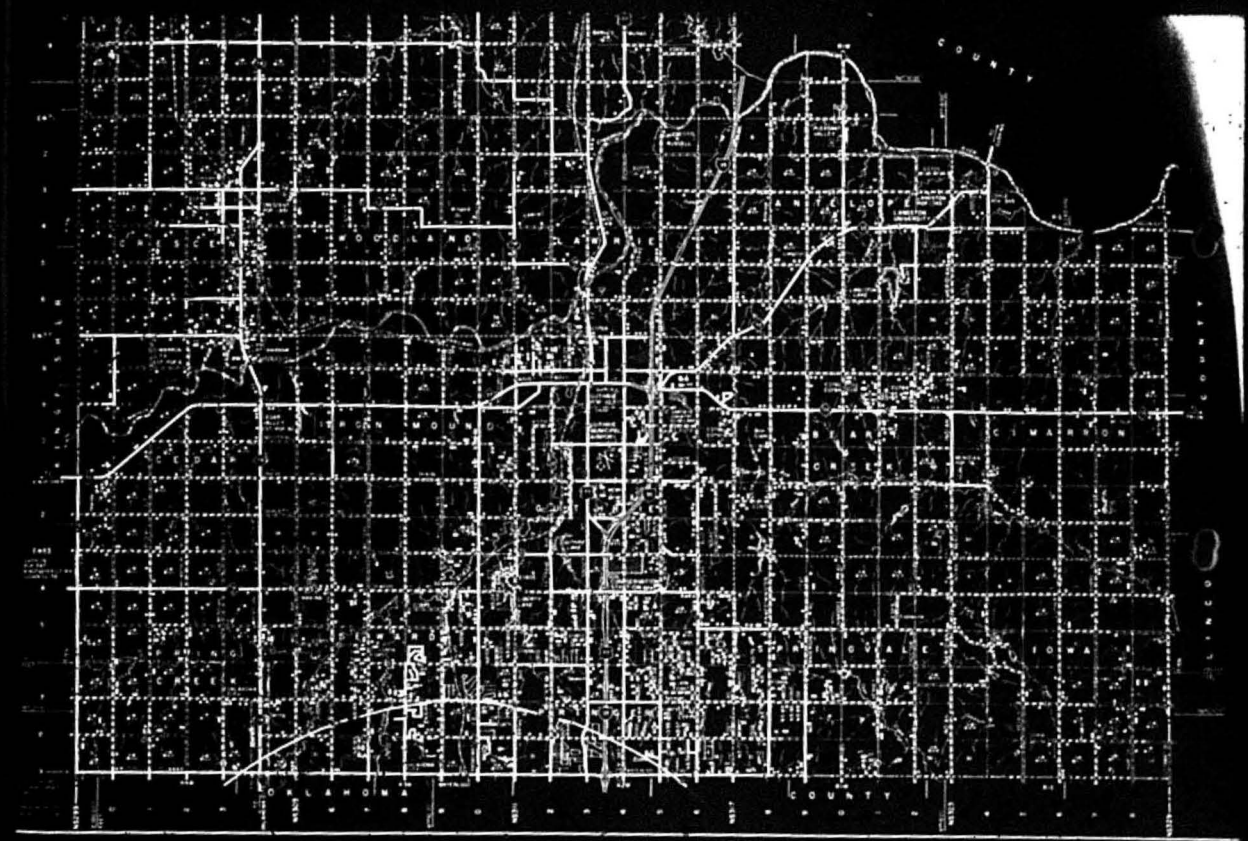

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NPL Site Tracking System, Version 1.01

: File Rept Util Quit to DOS Record : 3 08/17/89 17 27

Site Name : TEST Brown Manufacturing
EPA ID # OKD007193222
Type Activity : PA
Report Source : STATE
Project Officer : Terry Andrews
PA completed by STATE : 9/18/89

Date Identified : 9/18/89
PA Petition : / /
Congressional Interest : No
Document Number :
Received by EPA : 9/22/89

Report Status Dates :
FIT Tasked : / /
Report Due : / /
Report Received : / /
EPA Review Due : 9/22/90
EPA Review Date : 1/10/90
EPA Reviewer : Driscoll

Extra-Departmental Reviews

	Submitted	Response
ERB :	/ /	/ /
ATSDR :	/ /	/ /
WSB :	/ /	/ /
MITRE :	/ /	/ /

Prescore : 0.00
HRS : 0.00

Action Taken : NFRAP
Comment :

Response to Source : / /

Review : File Maintenance Submenu : 2

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Joan K. Leavitt, M.D.
Commissioner

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Ernest D. Martin, R.Ph.
Lee W. Paden

OKLAHOMA STATE
DEPARTMENT OF HEALTH

P.O. BOX 53551
1000 N.E. TENTH
OKLAHOMA CITY, OK 73152

AN EQUAL OPPORTUNITY EMPLOYER

September 19, 1989

RECEIVED
EPA REGION VI
89 SEP 22 PM 12:20
SUPERFUND BRANCH

Robie Hirt, (6H-SS)
U.S. Environmental Protection Agency
Region VI
First Interstate Bank Building
1445 Ross Avenue
Dallas, Texas 75202-2733

Dear Ms. Hirt:

Enclosed are a discovery form, PA report, and PA Questionnaire for the Brown Manufacturing ~~Company site~~. If you have any questions please give me a call at (405) 271-7049.

Sincerely,

Terry Andrews

Terry Andrews
Environmental Specialist
Superfund Section

TA/db

Enclosure

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OKLAHOMA'S WATER QUALITY STANDARDS 1988

OKLAHOMA WATER RESOURCES BOARD

AUTHORITY: 82 O.S. Supp. 1988, §§926.3, 926.6, and 1085.2

Adopted by the Oklahoma Water Resources Board on February 14, 1989.

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W.Q. BASIN NO. 6, SHEET 2

TRIBUTARY SEQUENCE 1 2 3 4 5 6	WATER QUALITY MANAGEMENT SEGMENT	BENEFICIAL USES: Public & Private Water Supply	Emergency Water Supply	Primary Warm Water Fishery	Habitat Limited Fishery	Smallmouth Bass Fishery	Trout Fishery	Agriculture	Hydroelectric Power	M & I Process & Cooling Water	Primary Recreation	Secondary Recreation	Navigation	Aesthetics	Limitations	REMARKS
Fitzgerald Creek	620900	X		X				X		X	X			X		
Langston Lake and Watershed	620900	X		X				X		X	X			X	SWS	
Beaver Creek	620900	X		X				X		X	X			X		
Skeleton Creek downstream from Bitter Creek	620910	X		X				2		X	X			X		
Skeleton Creek from Bitter Creek to Boggy Creek	620910		X		X			X		X		X		X		
Skeleton Creek upstream from Boggy Creek	620910	X		X				1		X	X			X		
Wolf Creek	620910	X		X				X		X	X			X		
Otter Creek	620910	X		X				X		X	X			X		
Horse Creek	620910	X		X				X		X	X			X		
Bitter Creek	620910	X		X				X		X	X			X		
Cottonwood Creek	620910	X		X				2		X	X			X		
Guthrie Lake and Watershed	620910	X		X				X		X	X			X	SWS	
Liberty Lake and Watershed	620910	X		X				X		X	X			X	SWS	
Chisholm Creek	620910	X		X				X		X	X			X		
Deer Creek	620910	X		X				X		X	X			X		
Bluff Creek	620900	X		X				X		X	X			X		
Kingfisher Creek	620910			X				X		X	X			X		
Uncle John Creek	620910			X				X		X	X			X		
Dead Indian Creek	620910	X		X				X		X	X			X		
Otter Creek	620910	X		X				X		X	X			X		
Turkey Creek	620910	X		X				X		X	X			X		
Cooper Creek	620910	X		X				X		X	X			X		
Salt Creek downstream from the Blaine-Kingfisher County Line	620910		X	X				2		X			X	X		
Salt Creek upstream from the Blaine-Kingfisher County Line	620910		X		X			2		X			X	X		

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OKLAHOMA'S

WATER ATLAS

Oklahoma Water Resources Board

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Gerald E. Borelli, ***Chairman***

Earl Walker, *Vice-Chairman*

L. L. Males, *Secretary*

R. G. Johnson, *Member*

Bill Secrest, Jr., *Member*

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Ralph G. McPherson, *Member*

Ernest R. "Jack" Tucker, *Member*

James R. Barnett, ***Executive Director***

Michael E. Melton, *Assistant Director*

Publication No. 120

November 1984

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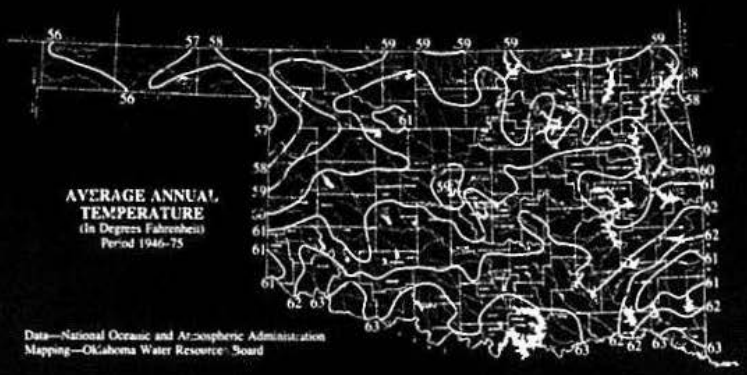

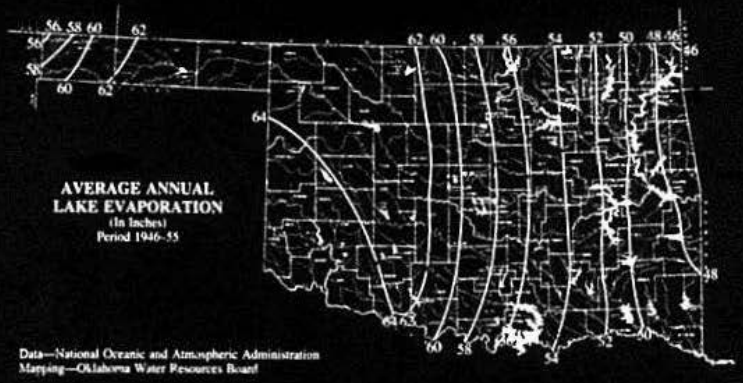

for the earliest day on which a below-zero minimum temperature was recorded. The record standing before the winter of 1983 was January 4, 1959.

The length of the growing season—defined as the period between the average date of the last 32 degree temperature in the Spring and the first 32 degree reading in the Fall—varies from 170 days in Cimarron County to 240 days in McCurtain County. East to west, along the northern border, the average date of the final Spring freeze varies from April 5 to April 27 and in the south, from March 27 to April 5. The first freeze of the Fall usually occurs between October 12 and October 27 in the north, and between November 5 and 10 along the southern border, with the latest freeze of the season recorded in south central Oklahoma.

Annual lake evaporation ranges from 48 inches in the extreme east to 65 inches in the southwestern corner. Evapotranspiration (loss of water into the air) and percolation (seepage of water into the ground) remove approximately 80 percent of Oklahoma's water from availability for immediate use.

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OKLAHOMA – A LAND OF CLIMATIC CONTRASTS

Climatically, Oklahoma is a borderland—temperate, but with wide variations caused by the blending of horizontal and vertical climatic zones. A humid belt in southern Oklahoma merges with a more variable and colder continental climatic belt on northern margins. Moist air currents from the Gulf of Mexico temper the weather during most of the year, until the cool, moist air masses from the Pacific and the cold, dry Canadian air masses seize control of Oklahoma's winter temperature and precipitation patterns.

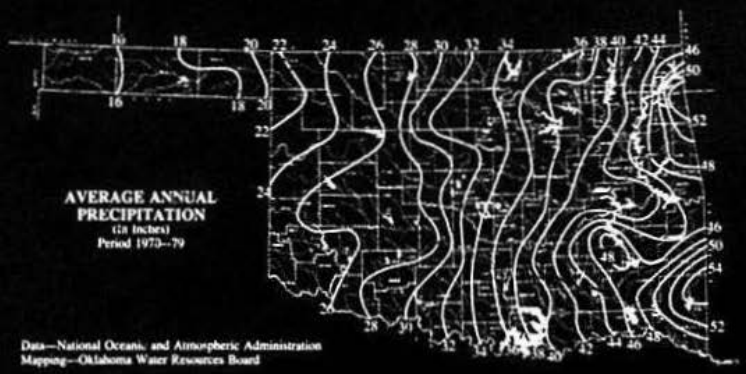
It is such collisions of warm and cold air masses that produce dramatic changes in the weather—stinging blizzards, violent thunderstorms and the black funnels that cause Oklahoma to report the highest concentration of tornadoes in the world.

Summers are long and hot, frequently punctuated by droughts of varying duration. Winters are generally less rigorous and shorter than the bitter winters inflicted on Oklahoma's northern plains neighbors.

Maximum precipitation occurs in May, making Spring the wettest season. Precipitation decreases in June, setting the stage for dry summers. Fall is the second wettest season, but again, rains taper off toward January, the state's driest month. Rainfall decreases sharply from east to west, ranging from an annual 56 inches measured in the southeastern corner to 15 inches in the western Panhandle. Official records reflect these extremes of 6.53 inches at Regnier in Cimarron County in 1956 and 84.47 inches at Kiamichi Tower in LeFlore County in 1957. Snowfall across the state follows a pattern opposite that of rainfall, with heavier amounts falling in the west. In the first four years of the 1980s, mean annual snowfall ranged from 20.22 inches in the northwest to 5.25 inches in the southeast. Despite recent heavy snowfalls in the west, winter precipitation accounts for a surprisingly small percentage of the west's total.

Mean annual temperature ranges from 64 degrees (Fahrenheit) along the southern border to 60 degrees in the northeast, decreasing westward across the Panhandle to 57 degrees. High readings of 120 degrees set the official record at several stations, and the low of −27 degrees remains on the record book for Watts in 1930 and Vinita in 1935.

Record arctic fronts plunged the state into the deepfreeze in December 1983, bringing with them mean monthly temperature readings 12 to 19 degrees below normal throughout the state. During that December 18 to 30 episode, Oklahoma endured the longest run of days in history in which the maximum temperature failed to reach 32 degrees. The cold spell also set a record



Data—National Oceanic and Atmospheric Administration
Mapping—Oklahoma Water Resources Board

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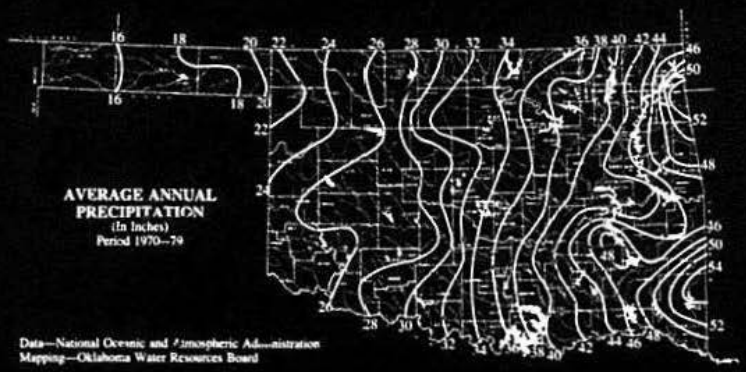

AVERAGE ANNUAL PRECIPITATION
(In Inches)
Period 1970–79

Data—National Oceanic and Atmospheric Administration
Mapping—Oklahoma Water Resources Board

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OKLAHOMA'S WATER ATLAS
PLATE 9
LOWER CIMARRON RIVER
OKLAHOMA WATER RESOURCES BOARD

Data—U.S.D.A. Soil Conservation Service and Oklahoma Water Re-
Mapping—Oklahoma Water Resources Board

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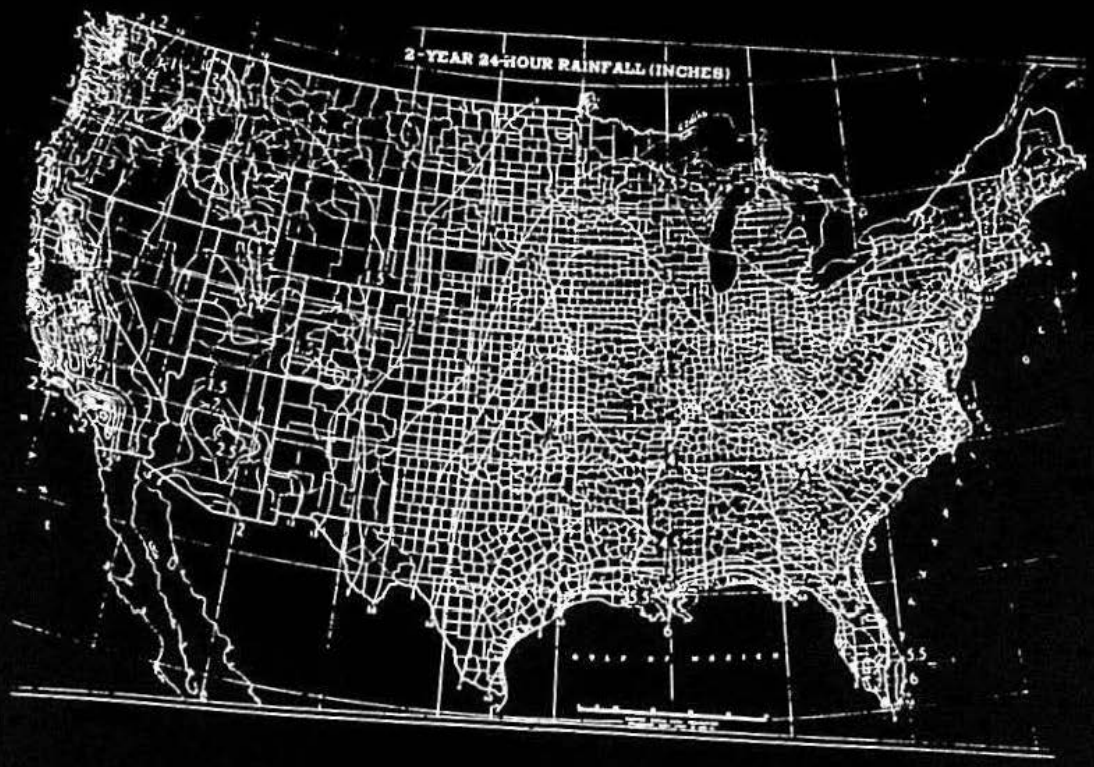

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OKLAHOMA STATE DEPARTMENT OF HEALTH
Environmental Health Service
State Environmental Laboratory
1000 N.E. Tenth
Oklahoma City, OK 73152

PUBLIC WATER SUPPLY REPORT

MAJOR THROUGH WOODWARD

1985

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PUBLIC WATER SUPPLY REPORT

FACILITY: EDMOND PWA
OPERATOR: EDMOND PWA
ADDRESS : P. O. BOX 2970 EDMOND OK 73083
PHONE : 405 3488830

MSIS-NUMBER : 2005905
COUNTY : OKLAHOMA
POPULATION SERVED:

SYSTEMS SERVED:
3005542 OAK RIDGE MHP
3005552 BUZ ALLEN UNIV-CITY MHP
3005543 EXETER MHP
NA 3005545 LAMPLIGHTER MHP

SOURCE OF WATER:	LEGAL DESCRIPTION	DEPTH
WELL 2	SE4SW4SW4S26T14NR2WIM	00400
WELL 3	SE4NW4NW4S26T14NR2WIM	00457
WELL 4	SE4NW4NW4S35T14NR2WIM	00445

STORAGE CAPACITY : 1000000 GALLONS
AVERAGE PRODUCTION: 3715000 GALLONS/DAY
PRODUCTION CAPACITY: 10000000 GALLONS/DAY

TREATMENT:
DISINFECTION - CHLORINE GAS

PARAMETERS	UNITS	1985	1982	1980
HARDNESS-CALCIUM	MG/L	124.00		
CHLORIDE	MG/L	< 1.00	< 0.40	0.14
NITRITE-TOTAL	MG/L	< 0.01		
NITRATE-NITRATE AS N	MG/L	< 0.01	< 0.01	< 0.01
PH (LAB)	STD UNIT	7.20	7.14	
SODIUM	MG/L	< 1.00	< 1.00	< 1.00
SOLIDS-TOTAL DISS	MG/L	1.00	2	1.00
ALKALINITY-TOTAL	MG/L	1.00	1.00	1.00
HARDNESS-TOTAL	MG/L	1.00	1.00	1.00
TURBIDITY	JTU			
ARSENIC-TOTAL	UG/L	< 10	< 10	< 10
BARIUM-TOTAL	UG/L	30	20	30
CADMIUM-TOTAL	UG/L	< 1.00	< 1.00	<
CHROMIUM-TOTAL	UG/L	< 1.00	< 1.00	
COPPER-TOTAL	UG/L			
IRON-TOTAL	UG/L	< 100	< 100	
LEAD-TOTAL	UG/L	< 1.00	< 1.00	
MANGANESE-TOTAL	UG/L	< 0.00	< 30	
MERCURY-TOTAL	UG/L	< 0.00	< 0.00	< 0.0
SELENIUM-TOTAL	UG/L	< 0.00	< 0.00	
SILVER-TOTAL	UG/L	< 1.00	< 1.00	< 1.00
CADMIUM-TOTAL	UG/L	2.00	28.00	38.00
ZINC-TOTAL	UG/L		10	61
CONDUCTIVITY	(CALC)	0.00		

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PUBLIC WATER SUPPLY REPORT

FACILITY: RTA TRAILER PARK & CAMPGROUND
OPERATOR: RTA TRAILER PARK & CAMPGROUND
ADDRESS : 12115 NE EXPRESSWAY
OKLA CITY OK 73131
PHONE : 405 4780278

NSIS-NUMBER : 5009548
COUNTY : OKLAHOMA
POPULATION SERVED: 100

SOURCE OF WATER:
WELL 1

LEGAL DESCRIPTION
SW4NW4NW4S20T13NR02WIM

DEPTH
00480

STORAGE CAPACITY : GALLONS
AVERAGE PRODUCTION: GALLONS/DAY

PRODUCTION CAPACITY: GALLONS/DAY

PARAMETERS	UNITS		1985
HARDNESS,CALCIUM	[illegible]		146.0
CHLORIDE	MG/L	<	10
FLUORIDE TOTAL	MG/L		0.[illegible]
NITRITE-NITRATE AS N	MG/L	<	0.[illegible]
PH (LAB)	STD UNIT		7.[illegible]
SULFATE	MG/L	<	[illegible]
SOLIDS TOTAL DISS	MG/L		[illegible]
ALKALINITY TOTAL	MG/L		[illegible]
HARDNESS TOTAL	MG/L		[illegible]
TURBIDITY	NTU		[illegible]
ARSENIC-TOTAL	UG/L	<	[illegible]
BARIUM TOTAL	UG/L	<	10
CADMIUM-TOTAL	UG/L		[illegible]
CHROMIUM-TOTAL	UG/L	<	[illegible]
COPPER-TOTAL	UG/L		[illegible]
IRON-TOTAL	UG/L		[illegible]
LEAD-TOTAL	UG/L	<	100
MANGANESE-TOTAL	UG/L	<	[illegible]
MERCURY-TOTAL	UG/L	<	[illegible]
SELENIUM-TOTAL	UG/L	<	0.[illegible]
SILVER-TOTAL	UG/L	<	[illegible]
SODIUM-TOTAL	UG/L		[illegible]
TIN-TOTAL	UG/L		[illegible]
CORROSIVITY	(CALC)	-	0.[illegible]

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REFERENCE 8

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1309 Main Street, Suite 900
Dallas, Texas
75201-4809

214/744-164.

RECEIVED
APR 12 1988
Waste Management Service

ICF TECHNOLOGY INCORPORATED

TO: David Wineman, Region VI, FPO

THRU: K. H. Malone, Jr., FITOM

THRU: Tim Hall, AFITOM

FROM: John L. Jones, FIT - Environmental Engineer

DATE: March 22, 1988

SUBJECT: List Of Manufacturers
TDD #F-6-8802-14

Attached is a compilation of all facilities arranged by city, listed in the Oklahoma Directory of Manufacturers from 1963 through 1983 under the classification, "electroplating, polishing, anodizing, and color". Each entry has the name and address of the facility and includes the edition of the directories (attached) in which it appears.

IF THE PAGE FILMED IS NOT AS LEGIBLE AS THIS LABEL, IT IS DUE TO THE QUALITY OF THE ORIGINAL.

City And Company Name	These Companies Are Listed In The Following Editions Of The Oklahoma Directory Of Manufacturers
MOORE	
Industrial Zinc Platers Inc. 135 S.E. 2 Moore, OK 73160	1983
MUSKOGEE	
Simmons Silverplating Shop 5400 W. Okmulgee Avenue Muskogee, OK 74401	1963, 1967
OKLAHOMA CITY	
Allied Industries Inc. 215 SE 2nd St. Oklahoma City, OK 73129	1970
Amerand Inc. 1601 NW 5th St. Oklahoma City, OK 73106	1970, 1972, 1974
B & C Plating & Mfg. Co., Inc. 1410 S. Walker Ave. Oklahoma City, OK 73109	1963
Brown Mfg., Co. 13431 Broadway Extension P.O. Box 14546 Oklahoma City, OK 73114	1963, 1972, 1974, 1976, 1978, 1980
Capitol Plating Co. 500 North Indiana Oklahoma City, OK 73106	1967, 1970, 1972, 1974 1976, 1978, 1980
Classen Plating Co. 2215 Classen Blvd. Oklahoma City, OK 73106	1963, 1967, 1970, 1972, 1974, 1976, 1978, 1980, 1983
Clayton Plating Co. 1336 West Main St. Oklahoma City, OK 73106	1963, 1967, 1978, 1980
Custom Wire Products Inc. 535 N. Virginia Rt. 12 Box 567b Oklahoma City, OK 73115	1978, 1980
D & K Plating Co. 4600 NW 7th St. P.O. Box 75098 Oklahoma City, OK 73107	1976, 1978, 1980, 1983

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Industrial Hard Chrome Co. (8)
1523 E. Marshall St. (6) — Chromium plating for the trade, specializing in polished rods and working barrels

Journey's Gift Shop (M)
1521 E. 15th St. (20) — Silver plating

Mac's Plating Works (32)
2138 Southwest Blvd.
P. O. Box 2371 (1) — Metal plating, sandblasting, aluminum processing

Precision Chrome Co. (M)
830 N. Atlanta Ave.,
P. O. Box 3248 (4) — Chromium and hard chromium plating

Southwest Metal Finishing Co. (18)
422 S. St. Louis Ave. (20) — Cadmium, chrome, copper, nickel, nickel-tin, silver, tin, and alloy plating, hard chrome and hard anodizing of aluminum and magnesium, anodizing, alumilizing, anodizing

United Plating Works, Inc. (21)
4118 N. Mingo Rd. — Plating aircraft engine parts

3479 COATING, ENGRAVING, AND ALLIED SERVICES, NOT ELSEWHERE CLASSIFIED

Bartlesville

Superior Welding, Inc. (12)
113 N. Johnstone Ave. — Metallizing and metal spraying for the trade

Blackwell

McCrory Welding Service (M)
118 N. A St. — Hard facing for the trade

Lawton

Gro-A-Name (M)
3111½ C Ave. — Miscellaneous engraved metal products, such as small signs, key tags and luggage tags. Engraving for the trade

Maysville

Sacred Pipe Coating, Inc. (15)
Rt. 1 — Coating of pipe with anticorrosive materials

Muskogee

Muskogee Iron Works (200)
Frankfort Ave. & Spaulding Blvd. — Galvanizing for the trade

Nowata

Nowata Pipe & Supply Co. (15)
710 E. Modoc Ave., P. O. Box 192 — Cement lining of pipes

Oklahoma City

Brown Mfg. Co. (50)
13421 Classen Blvd.,
P. O. Box 8777 (14) — Metal processing for the trade: baked enameling, etching, polishing

DeClue, Donald B.
800 Colcord Bldg. (2) — Engraving and pantography for the trade, plastic engraving

Drilling Equipment Mfg. Co., Inc. (37)
845 S. E. 29th St., P. O. Box 4728 (9) — Parkerizing

Globe Galvanizing Co. (M)
1037 S. E. 26th St. (29) — Galvanizing and tin coating of metal products

Goodnight, C. C., Welding (M)
5920 39th St. Expressway (22) — Hard facing for the trade

Industrial Finishing & Wire
Products Mfg. Co., Inc. (10)
1800 N. W. 5th St. (6) — Metal finishing, painting of manufactured products, baked enameling, etc. for the trade

Oklahoma Industrial Finishing Co. (M)
4026 N. Barnes Ave. (12) — Metal finishing baked enameling

Pipe Coating of Tulsa, Inc. (19)
27 N. W. 50th St. (18) — Pipe coating and wrapping

Southwestern Engraving Co.
318 N. W. 3rd St. (2) — Engraved brass and copper plaques, cigarette boxes and similar items for awards and gifts

Trophy Center, Inc., The (6)
2716 S. Robinson Ave. (9) — Engraving

Fisher

Ingram Machinery Co. (M)
526 N. Connell Ave., P. O. Box 305 — Metallizing bearings and shafts

Ponca City

Holloway Hard Facing Co. (M)
451 S. Pine St. — Custom hard facing

Poteau

Graphics, Inc. (15)
3 Mi. N. of City,
U.S. Highway 271 — Fabrication and custom machine engraving of all plastics and metals

Seminole

Tomaco, Inc. (15)
930 E. Strothers Ave.
O — First National Bank Bldg.,
Seminole, Okla. — Pipe coating, plastic coating, cement lining

Tulsa

Aluminum Hardcoat Co. (5)
124 N. Peoria Ave. (20) — Plating

American Coating Supply Co. (8)
400 S. 28th West Ave.
O — 2240 E. Apache St.,
P. O. Box 3067, Tulsa 4, Okla. — Specialties for pipe coating contractors

Boyles Galvanizing Co. (20)
2349 W. 5th St., P. O. Box 1747 (1) — Hot dip galvanizing

Bradford Companies, The (12)
4501 W. 31st St., P. O. Box 7447 (7) — Cement lining of pipe

Brooks Metallizing Co. (7)
3 N. Cheyenne Ave., P. O. Box 587 (1) — Metallizing

Brown & Hartman Engraving Co. (9)
152 S. Quincy Ave. (20) — Engraved brass and aluminum name plates

Custom Painting Co. (M)
3208 S. 57th West Ave. (7) — Wrinkle painting, baked enameling and lacquering

Hill Brothers Spray Welding Co. (5)
2317 Southwest Blvd. (7) — Sprayed metal coatings

Mac's Plating Works (32)
2138 Southwest Blvd., P. O. Box 2371 (1) — Painting

Multi Color Process Co. (33)
335 S. Quincy Ave. — Etched and painted metal name plates

Rogers Galvanizing Co., Inc. (45)
1800 W. 21st St., P. O. Box 1902 (1) — Hot dip galvanizing

Southwest Metal Finishing Co. (18)
422 S. St. Louis Ave. (20) — Dow 7 and 9, vapor blasting, coating impregnating, dry film lubricants, baked enameling

Superior Hardsurfacing Co. (0)
2229 W. 21st St., P. O. Box 9297 (7) — Industrial hard facing

Tulsa Engraving & Trophy Co. (M)
11 Court Arcade Bldg., 523 S. Boulder Ave. (3) — Engraving

Tulsa Pipe Coating, Inc. (2)
3848 E. 11th St.
O — 2240 E. Apache St.,
P. O. Box 3067, Tulsa 4, Okla. — Applications of hot tar compounds to steel pipe for protection against corrosion

Zom Trophy & Engraving Co. (M)
Orpheum Bldg., 14 E. 4th St. (3) — Engraving of trophies and fine jewelry and monogramming

Wakita

Adams, W. E., Co. (8)
P. O. Box 168 — Hard facing of tools for implement dealers and manufacturers

Group 348. — MISCELLANEOUS FABRICATED WIRE PRODUCTS

3481 MISCELLANEOUS FABRICATED WIRE PRODUCTS

Lawton

American Wire & Pipe Co. (9)
712 Douglas Ave., P. O. Box 185 — Chain link fence fabric

Miami

Dixon E-Z On Holder (M)
14 A St. N. W.,
P. O. Box 648 — Florists' supplies, wire forms for holding flower arrangements

North Miami

Cobus Spring Service, Inc. (10)
U. S. Highway 66, P. O. Box 235 — Coil springs

Oklahoma City

Acme Fence & Iron Co., Inc. (25)
1715 Agnew Ave., P. O. Box 2725 (8) — Chain link wire fencing

Folding Carrier Corp. (175)
100 S. E. 2nd St. (25) — Shopping carts, wire forms, woven wire products

Industrial Finishing & Wire
Products Mfg. Co., Inc. (7)
1800 N. W. 5th St. (6) — Wire display racks, stands and baskets

Stafford Mfg. Co. (M)
340 W. Britton Rd. (14) — Chain link fence

Tulsa

Dixie Spring Co. (M)
213 E. 1st St. (3) — Helical wire springs

Industrial Splicing (M)
304 E. Brady St. (20) — Wire rope chokers, slings and splicing

T & B Sales Co. (M)
10749 E. 11th St. (28) — Plate hangers and easels, cup and saucer hangers and easels, plant supports, and markers

Tulsa Oklahoma Precision Springs, Inc.
2801 Dawson Rd. (15) — Wire springs and forms

Group 349. — MISCELLANEOUS FABRICATED METAL PRODUCTS

3491 METAL SHIPPING BARRELS, DRUMS, KEGS, AND PAILS

Oklahoma City

Capitol City Barrel & Drum Co. (M)
1516 Agnew Ave. (8) — Renewed steel barrels and drums

Wylie, Joe S., Co. (M)
1700 W. Reno Ave., P. O. Box 2486 (7) — Metal containers

Tulsa

Drum Service Co. (0)
3717 W. 31st St. (7) — Renewed steel drums

Tulsa Tallow & Feed Co., Inc. (10)
1800 N. Yale Ave.,
P. O. Box 5215 (12) — Reconditioned steel drums

3493 STEEL SPRINGS

North Miami

Cobus Spring Service, Inc. (10)
U. S. Highway 66, P. O. Box 235 — Leaf springs

Oklahoma City

City Spring Works, Inc. (M)
1127 W. Main St. (6) — Automobile, truck and bus springs

Tulsa

Tulsa Auto Spring Co. (22)
3 S. Lansing Ave. (20) — Automobile, bus, truck, and special steel leaf springs

3494 VALVES AND PIPE FITTINGS, EXCEPT PLUMBERS' BRASS GOODS

Altus

Paul's Machine & Supply (M)
401 W. Pecan St., P. O. Box 85 — Irrigation pipe clamps

Bartlesville

Metal Goods Mfg. Co. (30)
110 S. Park Ave. — Special valves, including excess flow check valves and others

Enid

Hackney Iron & Steel Co. (190)
121 E. Cherokee Ave. — Welding pipe fittings, welding caps

Oklahoma City

Drilling Equipment Mfg. Co., Inc. (57)
845 S. E. 29th St.,
P. O. Box 4728 (9) — High pressure gate valves, butterfly valves, relief valves

Kinney, Inc. (101)
52 N. W. 42nd St. (18) — Oil and water valves

M Co Valve Mfg. Co., Inc. (M)
1702 Camden Way,
P. O. Box 3411 (3) — [illegible]

Well Controls, Inc. (M)
2800 S. E. 29th St.,
P. O. Box 4446 (9) — Manifolds, fittings, field equipment

Ponca City

Mertz Iron & Machine Works (9)
212 S. 2nd St. — Pipe clamps and pipe [illegible]

Sand Springs

American Fitting Co. (15)
10003 Charles Page Blvd. — [illegible] welding ells

Sapulpa

Tri-State Machine & Mfg. Co. (M)
18 E. Cleveland Ave. — Valves

Stroud

Central Plastics Co. (21)
304 W. Main St., P. O. Box 742 — [illegible]

Tulsa

Associate Industries (M)
1225 W. Oklahoma St. (27) — Oil field pipe fittings

Bartolina Mfg. Co. (0)
420 E. Archer St. (70) — Outlets, flanges, orifice plates, outlets, special fittings, pipe handling

Bus-Co Equipment Engineering & Mfg. (M)
1533 E. 7th St.,
P. O. Box 4424 (14) — Pipe [illegible]

Continental Industries, Inc. (15)
7401 E. 41st St. (45) — Gas [illegible]

Edwards, Allan, Inc. (12)
2445 S. Jackson Ave. (7) — Welding [illegible]

Flow-Rite Valve & Mfg., Inc. (M)
1023 E. 4th St., P. O. Box 1855 (1) — Valves for oil and [illegible]

Hornby Machine Works (14)
624 N. Rockford Ave. (6) — [illegible]

Hale Mfg. Co. (40)
2605 E. King St., P. O. Box 2679 (1) — Valves

Hodgson Engineering & Mfg. Co. (M)
1501 E. 7th St. (20) — Oil and [illegible] valves

Johnston Mfg. Co. (12)
1073 N. Quanah Ave.,
P. O. Box 1708 (1) — [illegible]

Nunn, W. C., Div. Dover Corp. (260)
10 N. Elwood Ave.,
P. O. Box 1739 (1) — Valves for petroleum and petrochemical [illegible]

Odell Valve Co. (182)
2950 Charles Page Blvd.,
P. O. Box 699 (1) — Gas, oil, valves

Sentinel Mfg. Co. (24)
4001 W. 51st St., P. O. Box 7004 (5) — Rebuilt [illegible]

Southern Supply Co. (7)
3443 W. 21st St. (7) — [illegible]

Wheatley, Frank, Pump & Valve Manufacturer (135)
520 S. 33rd West Ave., P. O. Box 1948 (1) — [illegible]

White Nipple & Machine Co., Inc. (15)
18 N. [illegible] Ave. (2) — [illegible]

Williamson, T. D., Inc. (84)
2733 E. Edward St.,
P. O. Box 40 (2) — [illegible]

3498 FABRICATED PIPE AND FABRICATED PIPE FITTINGS

Blackwell

McCrory Welding Service (M)
118 N. A St. — [illegible]

Oklahoma City

International Mfg. Co., Inc. (70)
600 E. Sheridan Ave. (4) — [illegible] coils and [illegible]

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OKLAHOMA

DIRECTORY OF MANUFACTURERS AND PRODUCTS, 1972

Secy. Oklahoma Tax

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SEMINOLE

mpany (50)

ngs-Power Press

SULPHUR

Co. (4)
306 W Muskogee
General Sheet Metal Work Shi-Maid

TULSA

Dunlap Mfg. Company (57)
5460 S Garnett Road
Box 45226
Fabrication-Structural to Prints

Industrial Gasket & Packing Co., Inc. (4)
1015 E 3rd St.
Sheet & Box O-Rings and Metal Stampings

Interstate Tool & Mfg., Inc. (35)
1044 N Columbia Place
P. O. Box 50326
Stampings

Kila Engineering & Mfg. Co. (2)
9203 E Admiral Court
Machine Parts

Nordam (48)
R. H. Siegfried, Inc.
510 S Lansing
Aluminum Honeycomb Panels and Structures

Nupar Mfg. Co. (65)
835 W 41st Street
Metal Stampings and Die Castings

Southern Specialties Co. (22)
1232 E 2nd St.
Metal Stampings

Space Tek Mfg. Co. (6)
1416 A N Harvard
Aero Space Machine Parts

Tulsa Division North American Rockwell (4000)
2000 N Memorial
Honeycomb and Metal to Metal Binding

3466—ORNAMENTAL IRON FABRICATING

TULSA

B & W Manufacturing Company (5)
4501 W 51st Street
Ornamental Iron Fabricating

GROUP 347—COATING, ENGRAVING AND ALLIED SERVICES

3471—ELECTROPLATING, PLATING, POLISHING, ANODIZING AND COLORING

DUNCAN

American Plating Co. (10)
411 Main St.
P. O. Box 1428
Custom Electroplating of Metals with Chrome, Hard, Nickel, and Cadium, Plating Also Electroless (Chemical) Nickel Plating

HARTSHORNE

Oklahoma Aerotronics, Inc. (220)
632 Penn Ave.
Electro Plating, Chemical Finishing and Painting

MIAMI

US Metal Container Co., Inc. (60)
204 - 22nd Avenue Northwest
Electroplating, Polishing, and Anodizing

OKLAHOMA CITY

Amerand, Inc. (65)
1601 NW 5th St.
Plating

Brown Mfg. Co. (100)
13431 Broadway Extension
P. O. Box 14546
Metal Finishing for the Trade Anodizing, Alodine

Capitol Plating Co. (4)
2300 SW 29th
Hard Chrome Plating

Classen Plating Co. (1)
2215 Classen Blvd.
Electroplating & Polishing Service for the Trade

F & K Plating Company (3)
4420 N Sewell
P. O. Box 25125
Electro Plating

Kool-Fuel Racing Products, Inc. (7)
215 SE 2nd St.
Industrial Plating

M-C-M Machine Works, Inc. (25)
901 SE 29th
P. O. Box 95025
Ultra Hard Chrome Plating for Industrial Uses

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OKLAHOMA
Directory of Manufacturers and Products, 1974

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Brown Mfg Co (30)
13431 Broadway Extension
P. O. Box 14546
Metal Finishing for the Trade Anodizing, Alodine

Capitol Plating Co. (4)
500 North Indiana
Hard Chrome Plating

Classen Plating Co. (1)
2215 Classen Blvd.
Electroplating & Polishing Service for the Trade

F & K Plating Company (3)
4420 N Sewell
Electro Plating

M-C-M Machine Works, Inc. (25)
901 SE 29th
P. O. Box 95325
Ultra Hard Chrome Plating for Industrial Uses

Nicholson Plating & Grinding Co., Inc. (20)
4625 NW 10th St.
Electro Plating & Precision Grinding & Anodizing

Ramos Plating Co. (5)
1320 South Walker
Electroplating-Chrome, Nickel, Copper Plating, anodizing, Black Penitrate, also Cadmium, Zink, Iridite, Alodining, Passivating.

Senter Plating Co., Inc. (4)
6908 N Western Ave.
Silver, Gold, Brass, Bronze, Nickel, and Copper Plating, repair on — Holloware — Flatware & Metal Art Objects.

Vemco Plating, Inc. (4)
8500 SW 8th St.
Electroplating & Anodizing of Metals

PRYOR

Polyguard Pipeline Products, Inc. (7)
Box 37
Wrapping & Coating for Oil & Gas Pipelines

TULSA

Aluminure Hardcoat Company (30)
6016 E Tecumseh
P. O. Box 51305
Metal Plating, Cad, Iridite, Anodize, Chrome, Zinc, Nickel, Copper

Chromium Plating Co. (18)
402 N Cheyenne
P. O. Box 1183
Electro Plating Hard Chrome, Cadmium, Nickel, & Anodizing, Cylindrical Grinding.

Custom Chrome Plating Company (20)
1613 E Marshall
Recondition Automobile Bumpers & Electroplating

Electro Platers (2)
624 E Archer
Electro Metal Plating

Evans Plating Works, Inc. (5)
22 N Cheyenne
Finishing on Manufactured Products, Cadmium, Chromium, Copper, and Nickel Electroplating & Zinc & Silver Metal Polishing and Buffing

Industrial Hard Chrome Co. (4)
7523 E Marshall
Chrome Plate Oil Field Pipes

Macs Plating Works (56)
2138 SW Blvd.
Metal Plating, Sandblasting, Aluminum Processing, Copper, Nickel, Chrome, Cadmium, Zinc, Anodizing, Zyglo & Magnoflex, and Chromatic Conversion

Modern Plating Company, Inc. (10)
1125 S Norwood
Plating for Defense, Space, Oil and Electronics

Nuchrome Plating Co. (3)
2812 W 40th St.
Chrome Plating

Royal Vista Precision Coatings, Inc (15)
7453 E 46th Place
P. O. Box 45651
Apply Spray Coatings

Southwest United Industries, Inc. (66)
422 S St. Louis Avenue
Electroplating, Hard Anodizing, Precision Grinding.

Spartan Aviation, Inc. (679)
Automation Industries, Inc.
7130 E Apache
Coating and Electroplating

3479—COATING, ENGRAVING AND ALLIED SERVICES NOT ELSEWHERE CLASSIFIED

BARTLESVILLE

Supreier Welding, Inc. (54)
101 N. Johnstone Ave.
Metallizing and Metal Spraying for the Trade

EDMOND

(Mi' Tuboscope (35)
3610 S Kelly
P. O. Box 766
Pipeline Coating, Internal Plastic Coating.

EL RENO

Cimarron Aircraft Corp (42)
Mustang Field
PO Box 369
Aircraft Painting, Interiors, Rebuilding.

Saide-Lingle Co Inc (20)
North Grand Street
PO Box 487
Pipe Coating & Wrapping

HARTSHORNE

Oklahoma Aerotronics, Inc. (220)
632 Penn Ave.
Nameplates and Decals

MIDWEST CITY

Sermetel Southwest, Inc. (12)
Teleflex, Inc.
8827 Newey Circle
Coatings for Prevention of Thermal-Oxidation and Heat Scaling in Corrosive Environments, Dry Film Lubricate Coatings, Emmisivity Control Coatings and Sermetel Fhouroplymers

NORMAN

Acme Fence and Iron Co., Inc. (75)
3505 N Interstate 35
P. O. Box 876
Galvanizing

OKLAHOMA CITY

Brown Mfg. Co. (100)
13431 Broadway Extension
P. O. Box 14546
Metal Fabricating for the Trade, Baked Enameling, Etching

Oklahoma Industrial Finishing Co. (4)
4036 N Barnes Ave.
Baked Enamel Finishing Metal

Tulsa Pipe Coating, Inc. (23)
27 NW 50th
Pipe Coating & Wrapping

[illegible]
Processing, [illegible]
Brazing, [illegible]
Engineer, [illegible]
Metal Spray Equipment [illegible]
Industry, Brazing Filler [illegible]
and Equipment, FAA Repair Station [illegible]
haul and repair of small aircraft [illegible]

PICHER

Ingram Machinery Co. (3)
526 N Connell
Box 305
Metallizing Bearings & Shafts

TULSA

American Coating Supply Co. (150)
2462 North Lewis
Box 50067
Pipe Line Construction Coating

Arrow Polishing & Plating Company (5)
1906 N Kingston
Metal Plating

Coating Laboratories (5)
505 S Quaker Avenue
Polymer Stucco-Non Cementitious-Ready Mix Stucorock.

Flint Steel Corp. (800)
2440 S Yukon Avenue
P. O. Box 1269
Galvanized Fabricated Steel

Fullers Engraving Co. (5)
3128 E Admiral Place
Engraved Signs & Nameplates

Juno Promotions (3)
1124 E 4th St.
Engraving

Krause Plastics (2)
1147 S 74th E[illegible]
Nameplate Engraving

Macs Plating Works (75)
2133 Six Flag[illegible]
Industrial Finishing

Moody's Jewelry (28)
1137 S Harvard Ave.
Machine & Hand Engraved Jewelry

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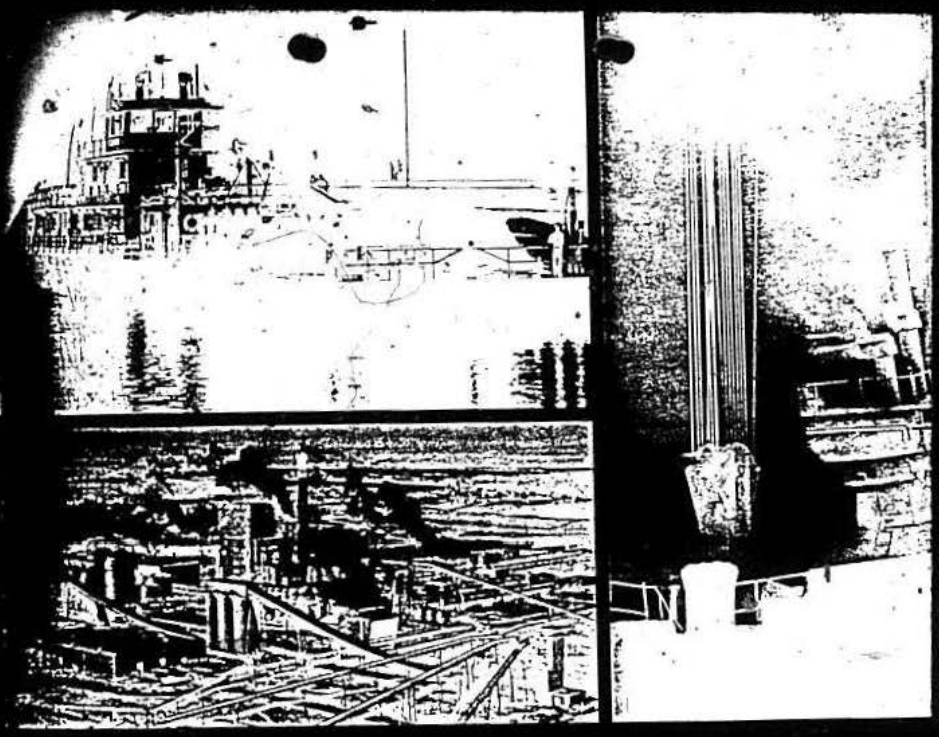

Oklahoma

Directory of Manufacturers and Products, 1976

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SEMINOLE

., Company (50)
ct
etal Stampings

SULPHUR

g. Co. (4)
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heet Metal Work, Shi-Maid

TULSA

. Company (80)
h Garnett Road
)
n-Structural to Prints

asket, Inc. (4)
Gasket, Inc.
d St.
ox O-Rings and Metal Stampings

ool & Mfg., Inc. (33)
olumbia Place
50326
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gfried, Inc.
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n and Fiberglass Honeycomb Panels
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pecialties Co. (22)
nd St.
mpings

: AND STEEL FORGINGS

PRYOR

Systems, Inc. (50)
rica Industrial District
309
d Condensers, Condensing Units, &
Chillers

TONKAWA

mpany, Inc.
Park
70
hors

3466—CROWNS AND CLOSURES

MUSKOGEE

Zapata Industries (77)
R.R. 5, Box 239
Metal Closures for Brewing & Soft Drink Industries

TULSA

B & W Manufacturing Company (8)
4501 West 51st Street
Ornamental Iro.. Fabricating

3469—METAL STAMPINGS NOT ELSEWHERE CLASSIFIED

BROKEN ARROW

T-P Metal Stampings & Mfg. Co., Inc. (5)
81st & 51 Highway, East
P.O. Box 288
Metal Stampings

CHOUTEAU

Sooner State Tool & Mfg. Co. (4)
R.R. 2, Box 197
Stampings

DURANT

Tate Bros. Mfg. Co. (27)
Star Route, Box 290
Refuse Containers, Dump Bodies, Custom Metal Work

MAZIE

Jackson Wire Mfg. Co. (12)
2 Miles West of Mazie
P.O. Box 427
Metal Stampings, Spot Welding

PRYOR

Red Devil, Inc. (80)
Mid American Ind. Dist.
P.O. Box A
Tile Products

TULSA

Anc-Co., Inc. (22)
Central Mfg. & Supply Co.
8144 East 44th Street
P.O. Box 791
Ponca City
Anchorage Materials and Metal Stampings

McKissick Products Company (442)
American Hoist & Derrick Co.
2857 Dawson Road
Box 3128
Hydraulic Presses

GROUP 347—COATING, ENGRAVING AND ALLIED SERVICES

3471—ELECTROPLATING, PLATING, POLISHING, ANODIZING AND COLORING

DUNCAN

American Plating Co. (12)
411 Main St.
P.O. Box 1428
Custom Electroplating of Metals with Chromium, Hard, Nickel, and Cadium, Plating also Electroless (Chemical) Nickel Plating

FAIRVIEW

Fairview Plating Co. (3)
126 North Santa Fe
Industrial Plating

HARTSHORNE

Oklahoma Aerotronics, Inc. (402)
632 Penn Ave.
Electro Plating, Chemical Finishing and Painting

MIAMI

U. S. Metal Container Co., Inc. (150)
204 22nd Avenue, Northwest
Electroplating, Polishing, and Anodizing

OKLAHOMA CITY

Crown Mfg. Co. (39)
13431 Broadway Extension
P.O. Box 14556
Metal Finishing for the Trade, Anodizing, Alodine

Capitol Plating Co. (4)
500 North Indiana
Hard Chrome Plating

Classen Plating Co. (1)
2215 Classen Blvd.
Electroplating & Polishing Service for the Trade

B & K Plating Co. (5)
4600 N.W. 7th Street
P.O. Box 75098
Job Plating-Nickel, Chrome, Copper-Polishing and Buffing

F & K Plating Company (3)
4420 North Sewell
Electroplating

M-C-M Machine Works, Inc. (68)
901 S.E. 29th
P.O. Box 95025
Ultra Hard Chrome Plating for Industrial Uses

Nicholson Plating & Grinding Co., Inc. (20)
4925 N.W. 10th St.
Electro Plating & Precision Grinding and Anodizing

Quality Metal Finishing, Inc. (4)
15½ S.W. 15th Street
P.O. Box 94219
Metal Finishing Only

Ramos Plating Co. (5)
1320 South Walker
Electroplating-Chrome, Nickel, Copper Plating, Anodizing, Black Penitrate, Also Cadmium, Zink, Iridite, Alodining, Passivating, Sandblasting & Flat Belt Sanding

S & S Plating Co. (2)
915 N. Classen
Electroplating

Senter Plating Co., Inc. (4)
6908 N. Western Ave.
Silver, Gold, Brass, Bronze, Nickel, and Copper Plating, Repair On - Holloware - Flatware & Metal Art Objects

Vemco Plating, Inc. (4)
8500 S.W. 8th St.
Electroplating & Anodizing of Metals

SAND SPRINGS

Protective Coating & Sandblasting Company (8)
S. Side Sand Springs River Bridge
P.O. Box 2296
Tulsa
Sandblasts, Preps and Prepares Metal Surfaces for Protective Coating and Applies All Such Forms of Protective Coating to Primarily Industrial Hard Surface Materials, Sandblasting and Painting

TULSA

Aluminum Hardcoat Company (30)
6016 E. Tecumseh
P.O. Box 51305
Metal Plating, Cad, Iridite, Anodize, Chrome, Zinc, Nickel, Copper

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TULSA

...w Products Co Inc (emp. 104)
...Place
...ts All Thread, Double End, Tap End, ...ja, And ...

...6—METAL FORGINGS AND STAMPINGS

...ON AND STEEL FORGINGS

PRYOR

... Systems Inc (emp. 57)
...ma Industrial District
... 309
...ing Condensers, Condensing Units, & Water ...

TULSA

...ge Inc (emp. 40)
... 49th W Ave
... 7309
...ne Forgings, Carbon & Alloy, Stainless Steel, ...er, Brass, Cupro Nickel, Aluminum, Everdur ...l, Monel, Inconel, & Incoloy Products ...ising Oil Rings, Tema Flanges, Discs, Tube ...s, Bars Supplied Primarily To The Shell & ... Heat Exchangers Market.

...OWNS AND CLOSURES

MUSKOGEE

...dustries (emp. 77)
...x 239
...tures For Brewing & Soft Drink Industries.

TULSA

...nufacturing Company (emp. 8)
...est 51st Street
...etal Iron Fabricating

...ETAL STAMPINGS, NOT ELSEWHERE ...LASSIFIED

BROKEN ARROW

... Stampings & Mfg. Co., Inc. (emp. 5)
...51 Hwy East
... 288
...tampings.

CHOUTEAU

...ate Tool & Mfg. Co. (emp. 4)
...x 197
...ngs.

CLAREMORE

...g Co (emp. 60)
...P Box 225-B
...tampings And Die Castings

DURANT

Tate Bros Mfg Inc (emp. 40)
Star Route Box 290
Refuse Containers, Dump Bodies, Custom Metal Work.

FAIRVIEW

Maher, Inc (emp. 11)
U S Highway 60 North
Steel Tool Boxes

KINGFISHER

Klingsick Machine Shop (emp. 3)
1107 S Main St
Tool Boxes

MAZIE

Jackson Wire Mfg. Co. (emp. 12)
2 Miles West Of Mazie
PO Box 427
Metal Stampings, Spot Welding

OKLAHOMA CITY

Industrial Gasket, Inc. (emp. 134)
301 South Walker
P O Box 24048
Metal Stampings

Techniform Corp. (emp. 20)
6 South Pennsylvania Avenue
P O box 1537
Production Steel Stamping & Automatic Bar Screw Machine Work.

OKMULGEE

Campbell Specialty Co Inc (emp. 30)
1604 West Fourth Street
P O Drawer 789
Steel Stampings

PONCA CITY

Ace-Co, Inc. (emp. 50)
Central Mfg. & Supply Co.
1018 West Hartford
PO Box 791
Anchorage Materials And Metal Stampings

Environmental Elements Corp-Tilco Products (emp. 181)
Koppers
Airport Industrial Complex
PO Box 2203
Metal Spinning

PRYOR

Red Devil Inc. (emp. 110)
Red Devil, Inc.
Mid American Ind. Dist.
PO Box A
Tie Products.

SEMINOLE

Runge, J A, Company (emp. 60)
415 "a" Street
Custom Metal Stampings.

TULSA

Industrial Gasket Inc. (emp. 4)
Industrial Gasket Inc.
1015 E 3rd St
Sheet & Box O Rings And Metal Stampings

Interstate Tool & Mfg Inc (emp. 33)
1044 N. Columbia Place
P O Box 50326
Stampings

McKissick Products Company (emp. 442)
American Hoist & Derrick Co
2857 Dawson Road
Box 3128
Hydraulic Presses.

Nordam (emp. 208)
510 S Lansing
PO Box 3365
Aluminum And Fiberglass Honeycomb Panels And Structures.

Southern Specialties Co (emp. 22)
1232 E 2nd St
Metal Stampings

GROUP 347—COATING, ENGRAVING, AND ALLIED SERVICES

3471—ELECTROPLATING, PLATING, POLISHING, ANODIZING, AND COLORING

DUNCAN

American Plating & Finishing Co Inc (emp. 6)
411 Main St.
P O Box 1428
Custom Electroplating Of Metals With Chromium, Hard, Nickel, And Cadium, Plating Also Electroless (Chemical) Nickel Plating

FAIRVIEW

Fairview Plating Co. (emp. 3)
126 North Santa Fe
Industrial Plating

HARTSHORNE

Oklahoma Aerotronics, Inc (emp. 316)
832 Penn Ave
Electro Plating, Chemical Finishing And Painting

MIAMI

U S Metal Container Co., Inc (emp. 150)
204 - 2nd Avenue Northwest
Electroplating, Polishing, And Anodizing

OKLAHOMA CITY

Brown Mfg Co (emp. 39)
13431 Broadway Extension
P O Box 14236
Metal Finishing For The Trade Anodizing, Alodine ...

Capitol Plating Co (emp. 4)
500 North Indiana
Hard Chrome Plating

Classen Plating Co (emp. 1)
2215 Classen Blvd
Electroplating & Polishing Service For The Trade

Clayton Plating Company (emp. 1)
1336 West Main Street
Commercial & Industrial Plating

Custom Wire Products Inc (emp. 18)
536 N Virginia
PO Box 94969
Wire Display Racks

D & K Plating Co. (emp. 5)
4600 NW 7th Street
PO Box 75098
Job Plating Nickel, Chrome, Copper-Polishing And Buffing

F & K Plating Company (emp. 4)
4420 North Sewell
Electro Plating

M-C-M Enterprises Corp (emp. 64)
901 S. E. 29th
P O Box 95025
Ultra Hard Chrome Plating For Industrial Use

Quality Metal Finishing, Inc. (emp. 9)
15 1/2 SW 15th Street
PO Box 34219
Metal Finishing Only

Ramos Plating Co (emp. 5)
1320 South Walker
Electroplating Chrome, Nickel, Copper Plating, Anodizing, Black Penitrate, Also Cadmium, Zink, Iridite, Alodining, Passivating, Sandblasting & Flat Belt Sanding

S & S Plating Co. (emp. 2)
915 N. Classen
Electro Plating

Senter Plating Co., Inc (emp. 4)
6908 N Western Ave
Silver, Gold, Brass, Bronze, Nickel, And Copper Plating, Repair On - Holloware - Flatware & Metal Art Objects.

SAND SPRINGS

Protective Coating & Sandblasting Company (emp. 8)
S Side Sand Springs River Bridge
PO Box 2966
Sandblasts, Preps And Prepares Metal Surfaces For Protective Coating And Applies All Such Forms Of Protective Coating, Tile Industrial Hard Surface Materials, Sandblasting And Painting

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466—CROWNS AND CLOSURES

MUSKOGEE

ipola Industries (Emp. 77)
Rt 6 Box 200, Muskogee, Ok 74401
Metal Closures For Brewing & Soft Drink Industries

TULSA

& W Mfg Co (Emp. 11)
4307 W. 51st Street, Tulsa, Ok 74107
Galvanized Iron Fabricating

469—METAL STAMPINGS, N.E.C.

BROKEN ARROW

P Metal Stampings & Mfg Co, Inc (Emp. 5)
81st & 51 Hwy East
PO Box 288, Broken Arrow, Ok 74012
Metal Stampings

CHOUTEAU

oner State Tool & Mfg Co (Emp. 4)
Rt 2 Box 197, Chouteau, Ok 74337
Stampings

CLAREMORE

ipar Mfg Co (Emp. 60)
Route 7 Box 229-B, Claremore, Ok 74017
Metal Stampings

DURANT

ne Bros Mfg. Inc (Emp. 40)
Star Route Box 290, Durant, Ok 74701
Refuse Containers, Dump Bodies, Custom Metal Work

FAIRVIEW

nbar, Inc (Emp. 11)
U.S. Highway 60 North, Fairview, Ok 73737
Steel Tool Boxes

KINGFISHER

ingsick Machine Shop (Emp. 3)
1107 S Main St, Kingfisher, Ok 73750
Tool Boxes

MAZIE

ckson Wire Mfg Co (Emp. 20)
2 Miles West Of Mazie
PO Box 427, Mazie, Ok 74353
Metal Stampings,Spot Welding,Coil Springs,Metal Springs

OKLAHOMA CITY

ustrial Gasket, Inc (Emp. 134)
P O Box 24048, Oklahoma City, Ok 73124
Metal Stampings

chelorm Corp (Emp. 20)
L. S. B. Inc, Oklahoma City, Ok
6 South Pennsylvania Avenue
P O Box 1537, Oklahoma City, Ok 73101
Production Steel Stamping & Automatic Bar Screw Machine Work

nd Industries, Inc. (Emp. 13)
Magna International, Inc., Toronto Ont.,Can.
2968 N. W. 3rd St., Oklahoma City, Ok 73107
Sheet Metal Stampings & Fabricated Parts

OKMULGEE

Campbell Specialty Co, Inc (Emp. 30)
1604 West Fourth Street
P O Drawer 749, Okmulgee, Ok 74447
Steel Stampings

PONCA CITY

Anc-Co, Inc (Emp. 50)
Central Mfg. & Supply Co., Ponca City, Ok
1018 West Hartford
PO Box 791, Ponca City, Ok 74601
Anchorage Materials And Metal Stampings

Environmental Elements Corp-Titus Prod (Emp. 161)
Keppers, Baltimore, Md
Airport Industrial Complex
PO Box 2203, Ponca City, Ok 74601
Metal Spinning

PRYOR

Red Devil, Inc (Emp. 82)
Red Devil, Inc., Union, Nj
Mid American Ind. Dist
PO Box A, Pryor, Ok 74361
Tile Products

SEMINOLE

Runge, J A, Co (Emp. 50)
415 A Street, Seminole, Ok 74868
Custom Metal Stampings

TULSA

Industrial Gasket, Inc (Emp. 4)
Industrial Gasket Inc., Okla City, Ok
1015 E 3rd St, Tulsa, Ok 74120
Sheet & Box O-Rings And Metal Stampings

Interstate Tool & Mfg. Inc (Emp. 40)
1044 N. Columbia Place
P O Box 50326, Tulsa, Ok 74150
Stampings

McKissick Products Co (Emp. 442)
American Hoist & Derrick Co, St Paul, Mn
2857 Dawson Road
Box 3128, Tulsa, Ok 74101
Hydraulic Presses

Nordam (Emp. 208)
510 S Lansing
PO Box 3365, Tulsa, Ok 74101
Aluminum And Fiberglass Honeycomb Panels And Structures

Southern Specialties Co (Emp. 22)
1232 E 2nd St, Tulsa, Ok 74120
Metal Stampings

GROUP 347—COATING, ENGRAVING, AND ALLIED SERVICES

3471—ELECTROPLATING, POLISHING, ANODIZE AND COLOR

DUNCAN

American Plating & Finishing Co, Inc (Emp. 6)
411 Main St.
P O Box 1428, Duncan, Ok 73533
Custom Electroplating Of Metals With Chromium, Hard Nickel, And Cadium. Also Electroless (Chemical) Nickel Plating.

FAIRVIEW

Fairview Plating Co (Emp. 3)
126 North Santa Fe, Fairview, Ok 73737
Industrial Plating

HARTSHORNE

Oklahoma Arrotronics, Inc (Emp. 350)
632 Penn Ave, Hartshorne, Ok 74547
Electro Plating, Chemical Finishing And Painting

MIAMI

U S Metal Container Co, Inc (Emp. 215)
204 - 22nd Avenue Northwest, Miami, Ok 74354
Electroplating, Polishing, And Anodizing

OKLAHOMA CITY

Brown Mfg Co (Emp. 38)
13431 Broadway Extension
P O Box 14546, Oklahoma City, Ok 73114
Metal Finishing For The Trade Anodizing, Alodine

Capitol Plating Co (Emp. 4)
500 North Indiana, Oklahoma City, Ok 73106
Hard Chrome Plating

Classen Plating Co (Emp. 1)
2215 Classen Blvd, Oklahoma City, Ok 73106
Electroplating & Polishing Service For The Trade

Clayton Plating Co (Emp. 3)
1108 West Main Street, Oklahoma City, Ok 73106
Commercial & Industrial Plating

Custom Wire Products Inc (Emp. 12)
535 N Virginia
Rt 12 Box 567b, Oklahoma City, Ok 73115
Wire Display Racks

D & K Plating Co (Emp. 5)
4600 NW 7th Street
PO Box 75098, Oklahoma City, Ok 73107
Job Platinn-Nickel, Chrome, Copper-Polishing And Buffing

F & K Plating Co (Emp. 4)
4420 North Sewell, Oklahoma City, Ok 73118
Electro Plating

M-C-M Enterprises Corp (Emp. 44)
901 S. E. 29th
PO Box 95025, Oklahoma City, Ok 73143
Ultra Hard Chrome Plating For Industrial Uses

Quality Metal Finishing, Inc (Emp. 9)
15 1/2 SW 15th Street
PO Box 94219, Oklahoma City, Ok 73109
Metal Finishing Only

Ramos Plating Co (Emp. 5)
1320 South Walker, Oklahoma City, Ok 73125
Electroplating-Chrome, Nickel, Copper Plating, Anodizing, Black Penitrate, Also Cadmium, Zinc, Iridite, Alodining, & Passivating

S & S Plating Co (Emp. 1)
800 N. Western, Oklahoma City, Ok 73106
Electro Plating

Senter Plating Co, Inc (Emp. [illegible])
6508 N Western Ave, Oklahoma City, Ok
Silver, Gold, Brass, Bronze, Nickel, Inc Copper Plating, Repair On Holloware Flatware & Metal Art Objects

SAND SPRINGS

Protective Coating & Sandblasting Co (Emp. 8)
S Side Sand Springs River Bridge
PO Box 2966, Tulsa, Ok 74101
Sandblasts, Preps And Prepares Metal Surfaces For Protective Coating And Applies All Such Forms Of Protective Coating To Primarily Industrial Hard Surface Materials, Sandblasting And Painting

Southwestern Porcelain, Inc (Emp. 80)
Orono Industries, Inc
S Edge Of City, U S Hwy 64
P O Box 8, Sand Springs, Ok 74063
Porcelain Enameling For The Trade Signs

SEMINOLE

Runge, J A, Co (Emp. 40)
415 A Street, Seminole, Ok 74868
Nickel Chrome Plating Of Own Manufactured Parts

TULSA

Aluminum Hardcoat Co (Emp. 30)
6016 E Tecumseh
P O Box 51305, Tulsa, Ok 74151
Metal Plating, Cad. Iridite, Anodize, Chrome, Zinc, Nickel, Copper

Basic Machine, Inc (Emp. 10)
820 North Atlanta, Tulsa, Ok 74110
General Machine Work

Chromium Plating Co (Emp. 40)
412 North Cheyenne
P O Box 1183, Tulsa, Ok 74101
Electro Plating Hard Chrome, Anodizing Cylindrical Grinding I D Grinding Hard Anodize (Automatic Zinc & Boiler)

Custom Chrome Plating Co (Emp. 13)
1613 East Marshall, Tulsa, Ok 74106
Reconditon Automobile Bumpers & Electroplating

Eaton Dan Inc (Emp. 18)
4959 N Mingo Rd, Tulsa, Ok 74117
Sandblasting And Coatin

Evans Plating Works (Emp. 4)
22 N Cincinnati, Tulsa, Ok 74103
Finishing On Manufactured Products, Cadmium, Chromium, Copper, And Nickel Electroplating & Zinc & Metal Polishing And Buffing

Industrial Hard Chrome Co (Emp. 4)
1523 E Marshall, Tulsa, Ok 74106
Chrome Plate On Field Pipes

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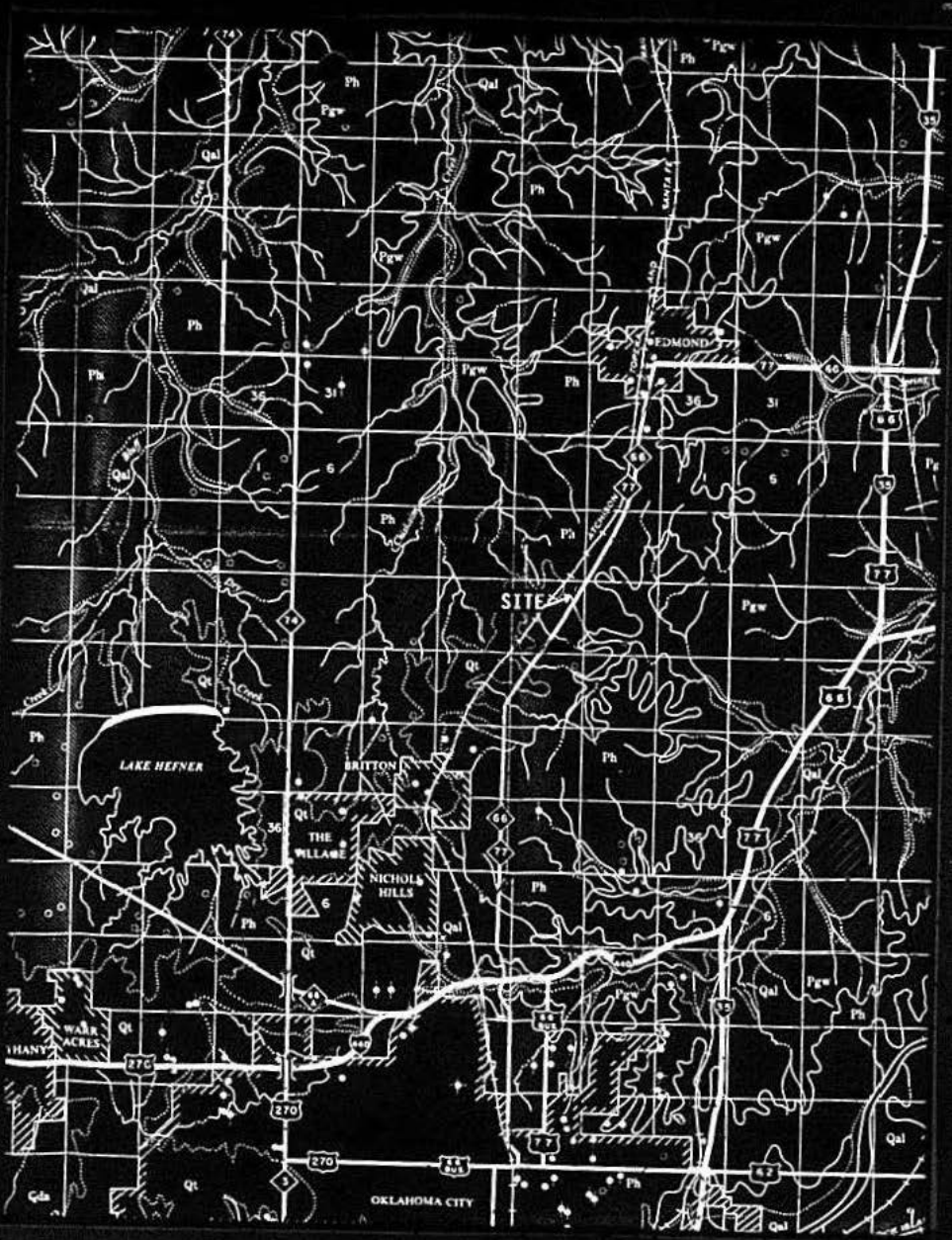

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EXPLANATION

QUATERNARY

Recent

Qds

DUNE SAND

(Fine to coarse windblown sand, moderately to highly permeable; generally above the water table; affords good opportunity for recharge to underlying units.)

Pleistocene

Qal

ALLUVIUM

(Sand, silt, clay, and sand and gravel in flood plains and channels of streams; moderately permeable; yields small to moderate amounts of hard water to wells. In many places, water contaminated by industrial wastes and unsuitable for domestic use.)

Qt

TERRACE DEPOSITS

(Gravel, sand, silt, and clay in and along the Canadian River and North Canadian River valleys; moderately permeable; yields small to moderate quantities of water to wells. Water quality suitable for most uses but may require softening for some purposes.)

PERMIAN

Lower Permian

Ped

CHICKASHA FORMATION
AND
DUNCAN SANDSTONE

(Reddish-brown sandstone, siltstone, shale, and siltstone conglomerate; poorly permeable; yields small quantities of water to wells. Water is hard and in some places highly mineralized.)

Ph

HENNESSEY SHALE

(Deep-red clay shale containing thin beds of sandstone and white or greenish bands of sands or calcareous shale; poorly permeable; yields small quantities of hard, highly mineralized water to wells.)

Pgw

GARBER SANDSTONE
AND
WELLINGTON FORMATION

(Deep-red to reddish-orange, massive and cross-bedded, fine-grained sandstone interbedded and interlingered with lenticular masses of red or gray shale; poorly to moderately permeable; yields moderate quantities of water to deep wells in western parts of Cleveland and Oklahoma Counties. Water from shallow wells hard to very hard; water from deep wells soft to moderately hard.)

Geology by C. L. Lasol Burton, 1951-1957. Bas Topical Survey topograp of Agriculture aerial pl Department of Highw

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GEOLOGY

The rocks exposed in Cleveland and Oklahoma Counties include consolidated sedimentary rocks (redbeds) of Permian age, and unconsolidated terrace deposits and alluvium of Quaternary age. Their lithologic character and water-bearing properties are summarized in table 2. Gravel, clay, and gravelly clay deposits older than those beneath the terraces cap some of the higher hills in the eastern part of the area. At some places, deposits ranging from 1 to 10 feet in thickness have been quarried for use in surfacing roads. These deposits are thin, cover limited areas in widely separated places, and are not a source of ground water. Hence, although of academic interest to the geologist and geomorphologist, the gravel deposits were not mapped and will not be discussed further in this report. Pennsylvanian and older rocks occur beneath the Permian rocks, and some of the older rocks contain petroleum and natural gas of considerable economic importance. However, all those rocks contain water too salty for domestic, municipal, and most industrial uses, and for this reason they are not discussed in this report.

Permian Rocks

The oldest rocks exposed in Cleveland and Oklahoma Counties are siltstones, sandstones, and shales of Permian age. The Permian rocks generally are called redbeds because they are predominantly red, although other colors, such as orange, maroon, purple, white, gray, and greenish gray, may be seen in exposures.

In ascending order, the Permian rocks exposed in Cleveland and Oklahoma Counties are: Wellington Formation, Garber Sandstone, Hennessey Shale, Duncan Sandstone, and Chickasha Formation. Miser (1954) mapped the Garber and Wellington as separate units north of the North Canadian River, but as a combined unit south of the river. Because of their lithologic similarity, the two formations constitute a single aquifer system. The upper sandy part of the Hennessey Shale has been called the Cedar Hills Sandstone Member in Canadian County and northwestward (Mogg, Schoff, and Bord, 1960; Miser, 1954; Fay, 1962; Ham, 1962; Bado and Jordan, 1962). The Cedar Hills Sandstone Member has not been recognized south of the North Canadian River. The Chickasha Formation and Duncan Sandstone were mapped separately in southeastern Canadian County by Armstrong (1958). Because of their small areal extent and unimportance as aquifers, these formations have been mapped as a single unit in this report.

The rocks of Permian age form roughly parallel outcrop patterns in the two counties (pl. 1; Miser, 1954). In Oklahoma County

the strike of the rocks is nearly northward, but in Cleveland County it is north-northwestward. The exposed bedrock formations become progressively younger toward the west, and their regional dip is 30 to 35 feet per mile westward and southwestward toward the trough of a large asymmetrical syncline commonly referred to as the Anadarko basin.

Although the regional structure is that of a gently westward-dipping homocline, local irregularities reflect important structures in deeply buried rocks. With respect to ground water, the more important of these irregularities are local flexures in the Garber Sandstone and Wellington Formation in the Oklahoma City and Midwest City areas. The flexures are related to and reflect the location of the structural high beneath the Oklahoma City oil field and the structural trough in the Midwest City area (Travis, 1930).

GARBER SANDSTONE AND WELLINGTON FORMATION

The Garber Sandstone and Wellington Formation crop out across the eastern two-thirds of Cleveland and Oklahoma Counties in a northward-trending belt 6 to 20 miles wide. The area of outcrop is characterized by rolling, steep-sided hills that are forested with scrub oak and other small, slow-growing deciduous trees.

The Wellington Formation is the oldest of the Permian rocks exposed in Cleveland and Oklahoma Counties. Its base is not exposed in either of the counties, and the Garber Sandstone conformably overlies or grades into it. Because of the absence of fossils and key beds and the similarities of lithology, the Garber Sandstone and Wellington Formation are not readily distinguishable in the area. The two formations have similar water-bearing characteristics and therefore have been mapped as a single unit (pl. 1).

The contact of the Garber Sandstone with the overlying Hennessey has been described as "apparently conformable" (Anderson, 1927, p. 9; Travis 1930, p. 11). Generally, the contact is relatively easy to recognize because it is marked by the boundary between forested hills of the Garber and the nearly smooth, grass-covered prairies developed on the Hennessey. However, close examination suggests that the contact is gradational, at least locally. In road cuts in the northern part of Oklahoma County, sandstone layers having a lithology similar to the Garber can be observed to grade laterally into shale resembling the Hennessey. Thus, in places there may be a zone 20 or 30 feet thick in which the two formations interfinger.

The Garber and Wellington consist of lenticular beds of massive-appearing, cross-bedded sandstone irregularly interbedded with shale which is in part sandy to silty. The sandstone layers are fine to very-fine grained and loosely cemented. According to C. L. Jacobsen (written communication, 1944), none of the sand in the Garber and Wellington is coarser than 0.310 mm (millimeter), and the average

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diameter of the grains is 0.151 mm. The sandstone is composed almost entirely of subangular to subrounded fragments of fine-grained quartz.

Cross-bedding in the sandstone is well developed and many layers that appear to be massive are actually formed by a large number of cross-bedded units, each only a few inches thick. The cross-bedded units are typically wedge shaped, the foreset inclinations vary greatly in direction, the laminations have little upward concavity, and the foresets are relatively short. Commonly, lenticular sandstone beds terminate laterally along cross-bedded laminations. In a single exposure the inclinations of the laminae may be in several directions, and commonly they are opposed.

The sandstone is poorly cemented and it crumbles easily. The most common cement is a fine red mud, although thin discontinuous beds and irregular masses of [illegible] have been cemented with calcite, dolomite, and barite. Sand-barite rosettes (Ham and Merritt, 1944, p. 30), fragments of fossilized wood, and small concretions and concretionary masses, composed chiefly of calcite, dolomite, barite, or hematite, have been reported from many beds. Thin discontinuous beds, layers, and stringers of dolomitic conglomerate or dolomitic sandstone occur at the base of sandstone beds in many places. Thin layers of chert conglomerate occur at the base of sandstone beds in a few places in the eastern part of the outcrop area.

In general, the sandstone content of the Garber and Wellington is greatest in northeastern Cleveland and southeastern Oklahoma Counties. In that area about 75 percent of the exposed rock is sandstone. From that area northward and southward along the strike of the beds and westward downdip, the sandstone content becomes progressively less and the proportion of shale progressively greater. Near the Canadian River in southern Cleveland County, the Garber and Wellington are about 25 percent sandstone and 75 percent shale. As the massive beds of sandstone, which are exposed in the eastern part of the area, are traced downdip and along the strike, the greatest thicknesses of sandstone occur at progressively greater depths. Individual sandstone layers range in thickness from a few inches to 10 feet or more and vary greatly in thickness in short distances. The sandstone beds range in color from nearly white to pink, orange, deep red, or purple. In many places, beds that are red or reddish brown on weathered outcrops are white or light gray in fresh exposures.

Although some sandstone beds are relatively thick, beds 1 feet or less in thickness are more common. For instance, a well drilled in 1943 for the city of Norman near SE cor. sec. 15, T. 9 N., R. 2 W., penetrated 43 sandstone beds, having an aggregate thickness of 371 feet between depths of 100 and 700 feet. These beds ranged in thickness from 1 to 30 feet, but only 4 were 20 or more feet thick, 20 ranged from 5 to 20 feet, and 21 were 5 feet or less. Shale layers ranged from 1 to 40 feet in thickness, but only 3 were more than 10 feet and 34 were 5 feet or less.

According to Jacobsen (written communication, 1944), the thickness of the Garber is about 400 feet in central Cleveland County, about 310 feet in central Oklahoma County, and about 300 feet at the north boundary line of Oklahoma County. The Wellington is about 100 feet thick in the outcrop area but attains a thickness of 700 feet in the subsurface. Therefore, the two formations as a unit have a total thickness of 800 to 1,000 feet.

The shale beds of the Garber and Wellington are nonlaminated, white to deep red, and vary greatly in thickness in short distances. In the Wellington the shale is clayey and blocky and breaks with a conchoidal fracture. In the Garber the shale commonly is silty or sandy. As previously noted, the proportion of shale increases somewhat downdip toward the west. Near the west edge of Cleveland and Oklahoma Counties the Garber and Wellington are largely shale or shale and siltstone that contains little fresh water (fig. 4).

HENNESSEY SHALE

The Hennessey Shale covers the western one-third of Cleveland and Oklahoma Counties. Its area of outcrop is characterized by relatively flat, grass-covered prairies, largely barren of trees except along the valleys of intermittent streams.

The Hennessey consists dominantly of reddish-brown shale containing layers of siltstone and fine-grained sandstone. The shales are clayey to silty, and the siltstones contain large amounts of clay. In places along the outcrop well-indurated beds of siltstone or sandstone have weathered to form low shelflike ledges.

Beds of essentially homogeneous shale range from a few inches to 10 feet or more in thickness. Much of the shale is massive; where stratification is evident, it ranges from thinly laminated to medium bedded. The massive shales weather to form polygonal fragments and break with sharp-edged conchoidal fractures. The siltstone and sandstone beds occur in well-indurated layers ranging from a few inches to about 10 feet in thickness. Some beds of both shale and siltstone have an abundance of light-gray and gray-green spots. In outcrops, white, gray, or light-green bands occur discontinuously in beds of shale and siltstone. Lenticular beds of fine-grained sandstone, ranging from less than 1 to about 11 feet in thickness, occur near the base of the formation. In outcrop areas the thicker sandstone beds form low, steep-sided, tree-covered hills similar to the hills in the outcrop area of the Garber Sandstone.

The Hennessey Shale has a total thickness of 600 to 610 feet; however, in most places in Cleveland and Oklahoma Counties the upper part of the formation has been removed by erosion. Its thick-

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men is believed to be about 200 feet at Norman, 45 to 100 feet in the Midwest City area east of the Oklahoma City anticline, 200 to 300 feet in the Oklahoma City area, and less than 400 feet northwest of Lake Hefner.

The Hennessey Shale as an aquifer.—Because of its lithology the Hennessey Shale is poorly permeable; however, it is an aquifer that furnishes small quantities of water to rural domestic and stock wells. About 90 percent of the wells are less than 80 feet deep, and most obtain their water supplies from a zone of weathered material above the relatively unaltered shale. Below the weathered zone, water is obtained from cavities left by the removal of soluble materials and from fractures.

The water from these wells is generally satisfactory in quality for domestic use but inadequate in quantity for a windmill or for a jet pump unless operated for brief periods in conjunction with a pressure tank. A few wells have been drilled to depths of 100 to 300 feet, and produce water largely from fractures or solution cavities that are recharged by downward seepage from the saturated zone in the weathered material. The water from the deep wells generally is highly mineralized and is used only for watering stock.

According to Dennis (1954, p. 54), the weathered zone in the Hennessey is an aquifer of local importance, although of small capacity and low permeability. Wells and holes tested by him showed transmissibilities ranging from 121 to about 2,100 gpd per foot. Several of the wells tested had specific capacities of the order of 1 to 2 gpm per foot of drawdown. During dry periods, however, the yields of all wells probably would decline as saturated material in the weathered zone became partly dewatered because of evaporation, transpiration, and pumping.

CHICKASHA FORMATION AND DUNCAN SANDSTONE

Beds of sandstone, siltstone, and shale exposed on the north side of the Canadian River in the northwest corner of Cleveland County and in the southwest corner of Oklahoma County have been referred to the Chickasha Formation and Duncan Sandstone (Armstrong, 1918). Because of their small areal extent and relative unimportance as aquifers, the Chickasha Formation and Duncan Sandstone have been mapped together for this report (pl. 1). The Chickasha and Duncan, which conformably overlie the Hennessey Shale, are 110 to 200 feet thick and consist of sandstone, siltstone, siltstone conglomerate, and shale. Armstrong described the sandstone as massive, cross-bedded, fine to very fine grained, and soft to well cemented. Some of the siltstone layers are highly cross-bedded and resistant to erosion so that they make small ledges or cap low hills. All beds are lenticular and the sandstone grades laterally into siltstone or shale. The sandstone beds commonly are red orange or pink orange, but locally are brown. The shale layers generally are red.

The Chickasha and Duncan are poorly permeable and have little value as an aquifer in Cleveland and Oklahoma Counties. They are tapped by only a few small-capacity wells for domestic and stock use. In general, the water is suitable for human consumption but, in some places, contains too much dissolved gypsum or is otherwise too highly mineralized even for stock use.

QUATERNARY DEPOSITS

The Quaternary deposits of Cleveland and Oklahoma Counties include terrace deposits at one or more levels in, or adjacent to, the valleys of the Canadian and North Canadian Rivers, alluvium in the valleys of the principal streams, and dune sand. The areal distribution of the deposits is shown on the geologic map (pl. 1), and their lithologic character and general hydrologic properties are summarized in table 2.

The Quaternary deposits supply ground water for rural, domestic, and stock purposes at many places in the two counties, and they are the source of most of the ground water used to satisfy the water needs of several small towns and unincorporated communities in the valleys of the Canadian and North Canadian Rivers. However, except for two areas along the Canadian River near Norman and an area along the North Canadian River between Oklahoma City and Lake Overholser, they have not been studied in detail.

The terrace deposits and dune sand overlie the Permian rocks and, because of their relatively high permeability, facilitate the recharge of the underlying rocks. Because the Quaternary deposits are more permeable than the Permian redbeds, springs, seeps, or "wet-weather springs" occur where the contact between the two is exposed in low areas. The alluvium generally fills valleys cut 20 to 100 or more feet below the uplands. Because of this topographic relationship, the alluvium receives some seepage from sandy units or fractured zones in the bedrock. This seepage helps to maintain a high water table in the alluvium. Water in the alluvium is discharged principally by evaporation and transpiration, but some moves downstream in the alluvial deposits, and some seeps into the stream channels to maintain flow in dry seasons.

TERRACE DEPOSITS

Terrace deposits consist of materials laid down by ancient streams, which, since the time of deposition, have cut valleys to lower levels. In Cleveland and Oklahoma Counties, the streams that made the deposits were ancestors of the Canadian and North Canadian Rivers. The deposits consist mostly of lenticular beds of sand, silt, clay, and gravel, which vary greatly in thickness within short lateral distances. Where they have sufficient saturated thickness, the terrace deposits yield larger quantities of water of lower mineralization than that in the Permian rocks, and, on the whole, water of

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TABLE 2—GEOLOGIC UNITS EXPOSED IN CLEVELAND AND OKLAHOMA COUNTIES

Systems	Series	Formations	Thickness (feet)	Descriptions and Distribution	Water-Bearing Properties
QUATERNARY	Recent	Dune sand	0-20	Fine-to-medium-grained, cross-bedded, well-sorted sand. Occurs as dunes and as sheets in areas of Cleveland County. Most extensive in the Canadian River valley in Cleveland County and in the Deep Fork valley in Oklahoma County.	Moderately to highly permeable. Not locally above the water table and yields little water. Where saturated, yields water readily to shallow wells. Most extensive in the Canadian River valley in Cleveland County. Yields most likely to be obtained in the Canadian River valley near Lake Thunderbird.
	Pleistocene and Recent	Alluvium	0-70	Unconsolidated and semicoherent beds of clay, silt, sand, and gravel in the flood plains and flanks of streams.	Moderately permeable. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.
		Terrace deposits	0-100	Unconsolidated and semicoherent beds of clay, silt, sand, and gravel. Occurs along the flanks of the valleys, at or near the level of the present flood plains.	Moderately permeable. Locally above the water table. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.
PERMIAN	Lower Permian	Chickasha Formation (Duncle, Southbow)	250±	Red and reddish-brown sandstone, siltstone, and shale; conspicuous gypsum. Underlies Cole, Norman, and Chickasha, Kansas, Oklahoma, and North Canadian, Kansas, Oklahoma, Canadian.	Poorly permeable. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.
		Hennessey Shale	200	Dominant rock type is gypsum. Also has red and green shale. Gypsum is generally thin and occurs in the upper part.	Poorly permeable. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.
		Garber Sandstone	500±	Composed of medium-to-coarse-grained, well-sorted sandstone. Contains some red shale and small lenses of gypsum.	Poorly permeable. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.
		Wellington Formation	300±	Composed of reddish-brown, green, and white shale, fine-grained sandstone, and siltstone. Shale and sandstone contain gypsum and are locally red, green, or mottled. Contains some thin beds of limestone and some cross-bedded sand.	Poorly permeable. Yields small to moderate amounts of water to wells and springs. Yields most abundant where saturated thickness is greater than 20 feet. Yields most abundant in the Canadian River valley in Cleveland County. Yields small amounts of water in Oklahoma County.

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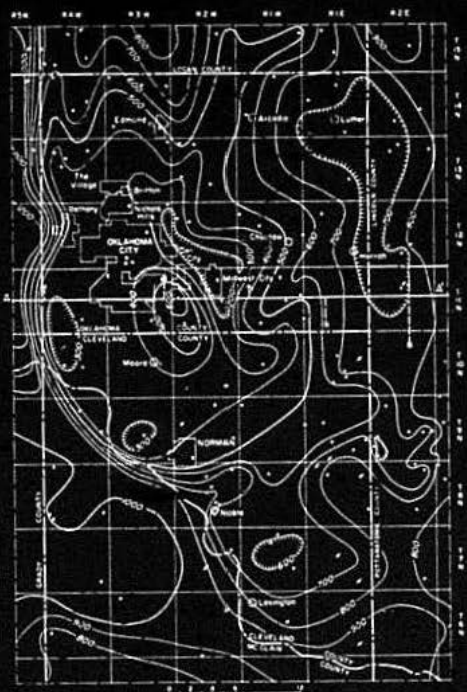

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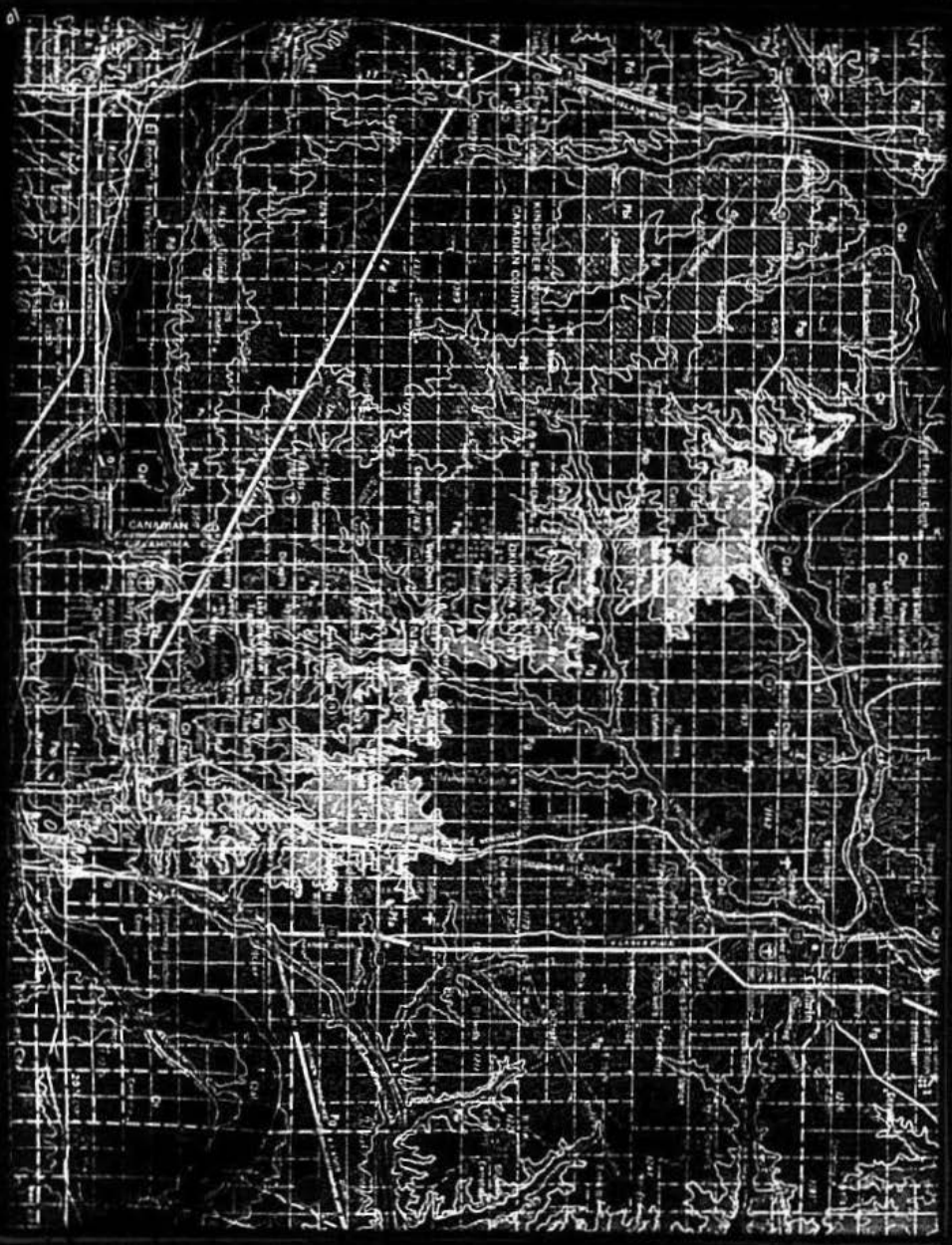

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EXPLANATION

The stratigraphic nomenclature and age determinations used herein are those accepted by the Oklahoma Geological Survey and do not necessarily agree with those of the U.S. Geological Survey.

Holocene

Qal

Alluvium

Sand, silt, clay, and lenticular beds of gravel. Thickness ranges from about 30 to 100 feet and probably averages about 50 feet along major streams. Along minor streams, thickness ranges from a few feet to about 50 feet and probably averages about 25 feet. Alluvium is a major aquifer in parts of quadrangle.

Pleistocene

Qt

Terrace deposits

Lenticular beds of sand, silt, clay, and gravel. Thickness ranges from a few feet to about 100 feet and probably averages about 50 feet along major streams. These deposits are major aquifers along Cimarron, Canadian, and North Canadian Rivers.

unconformity

Permian — Whitehorse Group

Pm

Marlow Formation

Mostly orange-brown fine-grained gypsiferous sandstone, with some red-brown shale. Contains 10 feet of calcitic sandstone lenses near middle and 2 thin dolomites (or gypsums) at top. Exposed thickness, about 50 feet (top 50 to 75 feet eroded).

Permian — El Reno Group

Dog Creek Shale

Mostly red-brown silty shale and some fine-grained sandstone. Contains one or two layers of thin dolomite (or gypsum) in lower part; basal part grades southward into Chickasha Formation. Thickness averages about 200 feet near Minco and 130 feet near Chickasha.

Pb

Blaine Formation

Mostly thin gypsums with thin dolomites below each gypsum, interbedded with red-brown shale; grades southward into Chickasha Formation. Thickness, 50 to 75 feet.

Pf

Flowerpot Shale

Mostly red-brown silty clay shale with stringers of gypsum (satin spar and selenite); grades southward into Chickasha Formation. Thickness, 20 to 40 feet.

Pc

Chickasha Formation

Variegated mudstone conglomerate and red-brown to orange-brown silty shale and siltstone, with minor amounts of orange-brown fine-grained sandstone; upper part grades northward into Dog Creek Shale, Blaine Formation,

YANIAN

Missourian

Hilltop Formatio

Mainly shale, grading upward into
fine-grained sandstone; grades northward in
Chanute Formation, and Dewey Limestone
0 to 200 feet.

Pb

Belle City Limesto

Consists of two fossiliferous limestone
vening fossiliferous shale. Thickness
feet; present in southern part of area only,
Formation.

Tallant Formatio

Mostly fine- to medium-grained san
thick overlain by shale 25 to 65 feet thick
Formation in central part of area. Total t
to 100 feet.

Pbd

Barnsdall Formati

Mostly fine-grained sandstone overlain by
ward into Wann Formation. Thickness ra
about 200 feet.

Pwi

Wann Formation and Iola l

Wann Formation, shale and fine- to m
stone; thickness 40 to 180 feet. Under
mainly fine-grained calcareous sand-
with some shale; thickness, 15 to 20 fe

Chanute Formatio

Mainly fine- to medium-grained sa
thick, overlain by shale 20 to 80 feet t
ranges from about 25 to 90 feet.

Pd

Dewey Limestone

Mainly sandy limestone or calcareous
limestone lenses 1.5 to 20 feet thick, o
50 feet thick. Total thickness ranges fr

Pnh

Nellie Bly Formation and Hogsh

Nellie Bly Formation, mainly shale wit
sandstone beds and limestone beds le

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PENNSYLVA

Hennessey Group

of orange-brown fine-grained sandstone; upper part grades northward into Dog Creek Shale, Blaine Formation, Flowerpot Shale, and upper part Cedar Hills Sandstone; lower part grades into Duncan S stone. Thickness, about 100 feet near Chickasha and 300 feet near Okarche.

Pd

DUNCAN SANDSTONE

Mainly red-brown to orange-brown fine-grained sandstone, with some mudstone conglomerate and shale; grades northward into Cedar Hills Sandstone and Chickasha Formation. Thickness, 450 feet near Chickasha, 300 feet near Oklahoma City, and 100 feet or more near Okarche.

Pch

CEDAR HILLS SANDSTONE

Lenticular beds of orange-brown fine-grained sandstone and red-brown shale; lower part grades southward into Duncan Sandstone. *Piedmont Sandstone Bed* at base. Thickness, 180 feet (only lower 80 feet exposed in mapped area).

Pbi

BISON FORMATION

Mostly red-brown shale; grades northward into many thin greenish-gray calcitic siltstones and some orange-brown fine-grained sandstones and siltstones. *Reeding Sandstone Bed* at base. Thickness ranges from 95 feet in south to 120 feet in north.

Psp

SALT PLAINS FORMATION

Red-brown blocky shale and orange-brown siltstone, grades southward into Purcell Sandstone in Norman area. Thickness, 200 feet.

Pk

KINGMAN SILTSTONE

Orange-brown to greenish-gray, even-bedded siltstones, with some fine-grained sandstone and red-brown shale; grades southward into Purcell Sandstone. Thickness, 30 feet.

Pp

PURCELL SANDSTONE

Red-brown to maroon fine- to coarse-grained sandstone, mudstone conglomerate, and red-brown shale. Thickness, 150 feet.

FAIRMONT SHALE

Red-brown blocky shale; grades into Garber Sandstone at base. Thickness, 30 feet at Oklahoma City, 110 feet near Purcell, and 120 feet near Kingfisher.

Sumner Group

Pg

GARBER SANDSTONE

Mostly orange-brown to red-brown fine-grained sandstone, irregularly bedded with red-brown shale and some chert and mudstone conglomerate. Thickness ranges from 150 feet in south to 400 feet or more in north. The Garber and underlying Wellington are major aquifers in Cleveland and Oklahoma Counties.

Pw

Nellie Bly Formation, mainly shale with ma sandstone beds and limestone beds locally thickness, about 250 to about 550 feet. U *shooter Limestone*, massive crinoidal limest thick.

Pcc

COFFEYVILLE FORMATION and CHECKERBOAR

Coffeyville Formation, mainly shale interbe to medium-grained sandstone locally contai limestone conglomerate and thin coal sea 150 to 470 feet. Underlying *Checkerboard Lim* line limestone 2.5 to 5 feet thick.

SEMINOLE FORMATION

Chert conglomerate, shale, and fine-grained taining coal seams in upper part locally. Th from 100 to 375 feet.

Desmoinesian

Ph

HOLDENVILLE SHALE

Mainly clay shale with some interbedded fin careous sandstone locally containing beds limestone. Thickness ranges from 100 to 280

Pw

WEWOKA FORMATION

Interbedded fine- to medium-grained sands careous shale. Thickness ranges from 400 to 7

Pwe

WETUMKA SHALE

Mainly sandy, silty, laminated shale 100 to 2

Pca

CALVIN SANDSTONE

Medium-grained, thin-bedded to massive sa silty shale. Thickness ranges from 230 to abou

Pse

SEMORA FORMATION

Mainly fine-grained micaceous sandstone and containing coal beds. Thickness ranges from 950 feet.

Pst

STUART SHALE

Mostly laminated clay shale and minor amo sandstone. Thickness ranges from 80 to 180 fe

THURMAN SANDSTONE

Mainly medium-grained, silty sandstone with glomerate at base. Only a few feet exposed in

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Sumner Group

irregularly bedded with red-brown shale and some chert and mudstone conglomerate. Th[illegible]ness ranges from 150 feet in south to 400 feet or more [illegible]rth. The Garber and underlying Wellington are major aquifers in Cleveland and Oklahoma Counties.

WELLINGTON FORMATION

Red-brown shale and orange-brown fine-grained sandstone, containing much maroon mudstone conglomerate and chert conglomerate to south. Thickness ranges from about 150 feet in south to 500 feet in north.

OSCAR GROUP

Red-brown to gray shale and orange-brown fine-grained, crossbedded sandstone; grades southward into arkosic sandstone and conglomerate. Includes *Herington Limestone* at top in Payne County, *Neva Limestone* (0.2 to 1.2 feet thick) at base in Lincoln County, and *Hart Limestone* (4 to 10 feet thick) at base in Pottawatomie County. In Payne County, includes thin stringers of *Winfield Limestone*, Pow (75 feet below top), *Fort Riley Limestone*, Pofr (245 feet below top), *Wreford Limestone*, Pow (345 feet below top), and *Cottonwood Limestone*, Poc (525 feet below top). Thickness ranges from 300 feet in south to 600 feet in north.

VANOSS GROUP

Red-brown to gray shale and orange-brown fine-grained, crossbedded sandstone; grades southward into arkosic sandstone and conglomerate. Includes many thin limestone beds and shale units north of North Canadian River (descending): *Roca Shale* (75 feet thick), *Red Eagle Limestone*, Pvre (3 to 8 feet thick), *Johnson Shale* (60 feet thick), *Long Creek Limestone*, Pvlc (9 to 12 feet thick), *Hughes Creek Shale* (52 feet thick), *Americus Limestone*, Pvs (1.0 to 2.5 feet thick), *Admire Shale* (70 feet thick), *Brownville Limestone*, Pvb (1 to 3 feet thick), *Pony Creek Shale* (75 feet thick), *Grayhorse Limestone*, Pvg (1 foot thick), unnamed shale (70 feet thick), *Elmont Limestone*, Pvr (1.2 to 7.8 feet thick), *Stonebreaker Shale* (60 feet thick), and *Reading Limestone* (1.5 feet thick), at base. Total thickness of group ranges from 250 feet in south to 450 feet in north.

ADA GROUP

Mostly orange-brown fine-grained sandstone and red-brown to gray shale; grades southward into chert conglomerates. Includes the following thin limestone beds and shale units north of North Canadian River (descending): *Auburn Shale* (80 feet thick), *Wahoruso Limestone*, Paw (1 to 6 feet thick), unnamed shale (95 feet thick), *Bird Creek Limestone*, Pab (1 to 9 feet thick), *Seevers-Aarde Shale* (45 feet thick), *Turkey Run Limestone*, Pat (1 foot thick), unnamed shale (45 feet thick), and *Lecompton Limestone* (1.5 to 10 feet thick), at base. Total thickness of group ranges from 100 feet in south to 280 feet in north.

VAMOOSA FORMATION

Alternating thin to massive layers of fine- to coarse-grained sandstone and sandy, silty shale containing some chert conglomerate in middle and lower parts of formation. Thickness ranges from about 200 to about 690 feet.

UNCONFORMITY

[illegible] glomerate at base. Only a few feet exposed [illegible]

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Fault, approximately located; dotted where upthrown side; D, downthrown side.

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BIDDLE

OKLAHOMA
POPULATION
REPORTS

POPULATION PROJECTIONS

1980 – 2000

Released July 1985

Research and Planning
Oklahoma Employment Security Commission

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TABLE III (Cont.)

POPULATION OF CITIES IN OKLAHOMA BY COUNTY

1980 - 2000

	1980	1985	1990	1995	2000
Murray County					
Davis	2,782	3,100	3,300	3,600	3,800
Dougherty	210	250	250	300	300
Hickory	95	100	100	150	150
Sulphur	5,516	5,900	6,100	6,400	6,700
Muskogee County					
Boynton	518	500	500	550	550
Braggs	351	350	350	350	350
Council Hill	141	150	150	150	150
Fort Gibson	2,477	2,800	3,000	3,400	3,700
Haskell	1,953	2,050	2,050	2,100	2,100
Muskogee	40,011	43,000	45,000	46,500	47,500
Okcaha	376	450	500	600	700
Porum	668	650	650	650	650
Summit	175	200	250	350	400
Taft	489	500	450	450	450
Wainwright	182	200	200	250	250
Warner	1,310	1,450	1,550	1,700	1,800
Webbers Falls	461	450	400	400	350
Noble County					
Billings	632	700	700	750	800
Marland	340	350	450	500	600
Morrison	671	750	850	1,000	1,150
Perry	5,796	6,100	6,200	6,200	6,300
Red Rock	376	350	400	450	550
Nowata County					
Delaware	544	550	550	550	600
Lenapah	350	350	400	400	450
New Alluwe	129	150	200	250	300
Nowata	4,270	4,300	4,400	4,600	4,700
South Coffeeville	873	900	950	1,050	1,150
Wann	156	150	150	200	200
Okfuskee County					
Beardon	80	100	150	200	250
Boley	423	400	400	450	500
Castle	130	150	150	200	250
Clearview	140	150	200	300	400
Okemah	3,381	3,700	3,900	4,500	5,200
Paden	448	450	500	600	650
Weleetka	1,195	1,300	1,350	1,550	1,800
Oklahoma County					
Bethany	22,038	25,200	26,900	28,600	29,800
Choctaw	7,520	9,500	11,300	13,500	15,100

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TABLE III (Cont.)

POPULATION OF CITIES IN OKLAHOMA BY COUNTY

1980 - 2000

	1980	1985	1990	1995	2000
Oklahoma County (cont.)					
Del City	28,523	33,400	37,000	40,600	43,400
Edmond	34,637	42,400	50,100	56,400	65,800
Forest Park	1,148	1,350	1,500	1,650	1,750
Harrah	2,897	3,600	4,200	4,800	5,300
Jones	2,270	2,700	3,100	3,500	3,900
Lake Aluma	101	100	100	100	100
Luther	1,159	1,500	1,750	2,000	2,250
Midwest City	49,559	58,000	62,100	66,400	69,500
Nichols Hills	4,171	4,000	3,800	3,700	3,500
Nicoma Park	2,588	3,100	3,500	3,800	4,100
Oklahoma City (part)	377,508	406,800	411,400	417,000	414,800
Smith Village	60	50	50	50	50
Spencer	4,064	5,000	5,700	6,500	7,100
The Village	11,114	12,000	12,100	12,100	12,200
Valleybrook	923	950	900	900	850
Warr Acres	9,940	10,700	10,500	10,400	10,200
Woodlawn Park	167	200	250	250	250
Okmulgee County					
Beggs	1,428	1,600	1,800	2,100	2,350
Bryant	74	100	100	100	150
Dewar	1,048	1,100	1,200	1,300	1,400
Grayson	150	200	250	250	350
Henryetta	6,432	6,800	7,000	7,300	7,600
Hoffman	407	450	500	600	700
Morris	1,288	1,450	1,600	1,900	2,150
Okmulgee	16,263	16,700	17,000	17,700	18,100
Winchester	150	200	250	350	450
Osage County					
Avant	461	550	650	750	900
Barnsdall	1,501	1,600	1,650	1,750	1,750
Burbank	161	200	200	200	200
Fairfax	1,949	2,200	2,350	2,500	2,600
Foraker	34	50	50	100	150
Grainola	67	50	100	100	100
Hominy	3,130	3,500	3,900	4,500	5,100
Osage	243	300	350	400	500
Pawhuska	4,771	5,200	5,600	6,200	6,700
Prue	554	650	850	1,100	1,350
Sand Springs (part)	259	300	400	600	800
Shidler	708	850	950	1,100	1,200
Skiatook (part)	1,816	2,200	2,600	3,100	3,500
Tulsa (part)	5,275	6,700	8,100	9,800	11,[illegible]
Webb City	157	150	150	200	200
Wynona	780	900	1,100	1,300	1,550

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TABLE III (Cont.)

POPULATION OF CITIES IN OKLAHOMA BY COUNTY

1980 - 2000

	1980	1985	1990	1995	2000
Lincoln County (cont.)					
Chandler	2,926	1,400	3,900	4,600	5,100
Davenport	974	1,200	1,450	1,750	2,050
Fallis	22	50	50	100	100
Kendrick	132	150	200	200	250
Meeker	1,032	1,250	1,550	1,900	2,200
Prague	2,208	2,700	3,200	3,900	4,500
Sparks	772	1,000	1,400	1,900	2,450
Stroud (part)	3,139	3,700	4,300	5,000	5,600
Tryon	435	550	700	850	1,050
Warwick	167	250	350	450	550
Wellston	802	1,000	1,200	1,450	1,650
Logan County					
Cashion (part)	56	50	100	150	200
Cedar Valley	34	50	100	100	150
Coyle	345	400	450	550	650
Crescent	1,651	2,100	2,500	3,000	3,400
Guthrie	11,133	13,000	15,100	17,500	19,700
Langston	443	500	550	600	700
Marshall	372	550	700	900	1,100
Meridian	78	100	150	200	250
Mulhall	301	400	450	550	650
Orlando	218	250	300	400	450
Love County					
Leon	120	150	150	150	200
Marietta	2,494	2,700	3,100	3,700	4,300
Thackerville	431	550	700	900	1,150
McClain County					
Blanchard (part)	1,638	2,100	2,200	2,400	2,600
Byars	353	450	500	650	750
Cole	309	450	600	800	1,000
Dibble	348	450	550	650	750
Goldsby	603	800	1,050	1,350	1,650
Newcastle	3,076	4,300	5,700	7,400	9,200
Oklahoma City (part)	123	200	300	300	400
Purcell	4,638	5,400	6,000	6,600	7,100
Rosedale	97	100	100	150	150
Washington	477	650	750	900	1,100
Wayne	621	750	850	950	1,050
McCurtain County					
Broken Bow	3,965	4,000	4,700	5,500	6,300
Garvin	162	150	200	200	250
Harris	192	200	300	350	450

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REFERENCE 12

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MEMORANDUM

DATE: July 12, 1989

TO: File

FROM: Terry Andrews, OSDH

SUBJECT: Visit to Brown Manufacturing Company, 13431 Broadway Extension, Oklahoma City, 73114

On July 11, 1989, I visited the Brown Manufacturing Company facility. I talked to the Facility Manager, C.D. Lawson, and he allowed me to walk around the facility and into the yard behind the plant. the Brown Manufacturing Co. manufactures decorative trim and louvers for buildings. They use an anodizing and allodizing treatment which consists of 11 tanks all approximately 20 foot by 3 foot and 3 foot deep. These tanks are utilized as a degreaser, CD Rinse, Caustic Etch, C.D. Rinse, Deoxidizer, CD Rinse, aliodine, CD Rinse, anodizing, gold dye tank, sealing tank, going from right to left.

They then have a 3000 gallon rinse tank and treat the solution they want to waste with sodium bisulfite. A colormetric titration test is ran to check chrome content. If it is o.k. then the rinse tank is drained into two 7500 gallon settling basins in a covered area outside the facility. There, pH is checked and flocculants are added as needed. When properly adjusted to meet City Permit requirements - the wastewater is discharged to the City Sewer. The Manager told me that they have a City Permit to discharge waste water.

I looked around and could not find any evidence of waste material deposition on the property. It looked like a very well managed, clean work place.

I asked the Manager how long they had the clarifiers and he said that they had got them last year. I asked him how they had treated the waste before they had the clarifiers and he said that they had treated them in the vats and containers. He said that they had never disposed of any waste except by lawful disposal in the city sewer. He said that they do not have any hazardous waste. He said that the facility had 25 employees and was owned by Russell Brown of Oklahoma City (751-1323). He said that the Brown Manufacturing Company has been operating since 1942.

I looked at the drainage pattern around the site and noticed that any surface runoff would run to the north down a ditch west of the service road. It then joined an intermittant stream which flows NW on the north side of Memorial Road.

The facility is located in an industrial area.

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REFERENCE 13

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The City of
OKLAHOMA CITY

FILE COPY

August 15, 1983

IWDP #076-FC
Brown Manufacturing Co.*
13431 Broadway Extension
Oklahoma City, OK 73114

RE: Renewal of Permit # 076-FC

Dear Sir:

The enclosed page represents the renewal of permit # 076-FC.

Respectfully,

James D. Couch, P.E., Director
Water and Wastewater Utilities Department

WK:vh

cc: Tom Carpenter, Treatment Superintendent

100 North Walker, 4th Floor · Oklahoma City, Oklahoma 73102 · 405/231-2422 405/231-2829

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CITY OF OKLAHOMA CITY

FILE COPY

DEPARTMENT OF WATER RESOURCES

FEDERAL CATEGORICAL INDUSTRIAL WASTEWATER DISCHARGE PERMIT

In accordance with Chapter 41, Article I-V of the Oklahoma City Code, designated as Oklahoma City Ordinance 17,501 establishing industrial pretreatment requirements as required by Federal Statutes and Regulations, a Federal Categorical Industrial Wastewater Discharge Permit, (Number 0076-FC), is Hereby Granted To:

PERMITTEE: BROWN MANUFACTURING COMPANY

ADDRESS: 13631 Broadway Extension

Oklahoma City, OK 73114 SIC CODE 3442; 3446; 3471; 2591

with authorization to discharge industrial wastewater with constituents whose concentrations are regulated by General Pretreatment Regulations to the Oklahoma City sanitary sewerage collection and treatment system in a manner that complies with any applicable provisions of Federal laws regulating discharge limits on industrial wastewater.

This permit is granted in accordance with the application filed on April 12th, 1985 in the office of the Director of Water Resources, 100 N. Walker, 4th floor, and in conformity with plans, specifications and other data submitted to the City of Oklahoma City in support of the above application, all of which are filed with and considered as part of this permit, together with the attached conditions and requirements.

Effective this 1st day of September, 1988

To Expire 31st day of August, 1989

Permitting Authority:

CITY OF OKLAHOMA CITY WATER RESOURCES DEPARTMENT

Name: Jan O Couch

Title: Director of Water & Wastewater Utilities

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REFERENCE 14

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MEMORANDUM

DATE: July 17, 1989

TO: File

FROM: Terry Andrews, OSDH

SUBJECT: City Permit for Brown Manufacturing Company

On July 13, 1989 I went down to the Oklahoma City Municipal Building and talked to Willard Keith who is with the Pretreatment Division of the Oklahoma City Water and Wastewater Utilities Department. He let me see the file that they had on Brown Manufacturing Company. I made a copy of the Industrial Discharge Permit IWDP #076-FC and looked thru the rest of the file. There was nothing in it to indicate that Brown Manufacturing Co. has ever dumped or stored hazardous waste on the property. Mr. Keith said that he has inspected the facility a few times and that he thought it was a good operation.

The permit application stated that the facility uses city supplied water and its own private well for water. The discharge of industrial wastewater is said to be sporadic and is estimated at 1200 gallons per day. The facility was permitted Dec. 1, 1978.

The facility has a good compliance record with the city.

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REFERENCE 15

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MEMORANDUM

DATE: July 19, 1988

TO: File

FROM: Terry Andrews, OSDH

SUBJECT: Search of Records for Brown Manufacturing Company

I search the Industrial Waste Division, OSDH, files for information about BMC and could not find anything. Apparently BMC is not a notifier of possessing or disposing of hazardous waste and has not had any complaints or investigations filed.